

Southern Power & Industry

The Industrial and Power Journal of the South and Southwest

JANUARY, 1960



TEAMWORK PAYS — The plant manager at Wolverine's Decatur, Alabama, plant tells how engineering, operating, and maintenance heads work together to make maintenance procedures effective — See P. 26.



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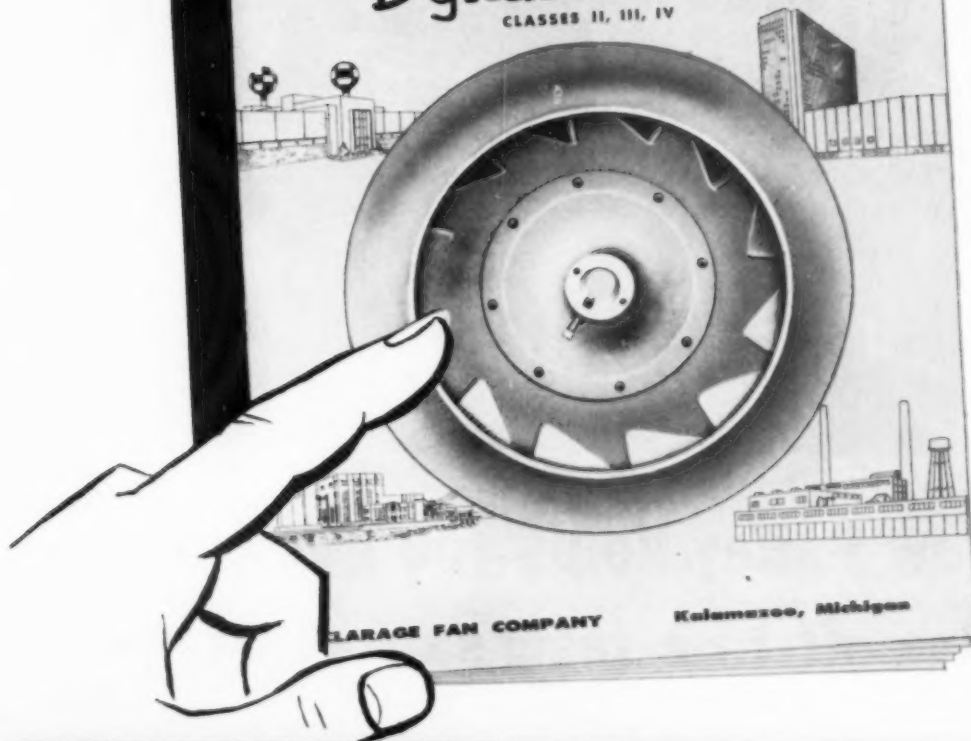
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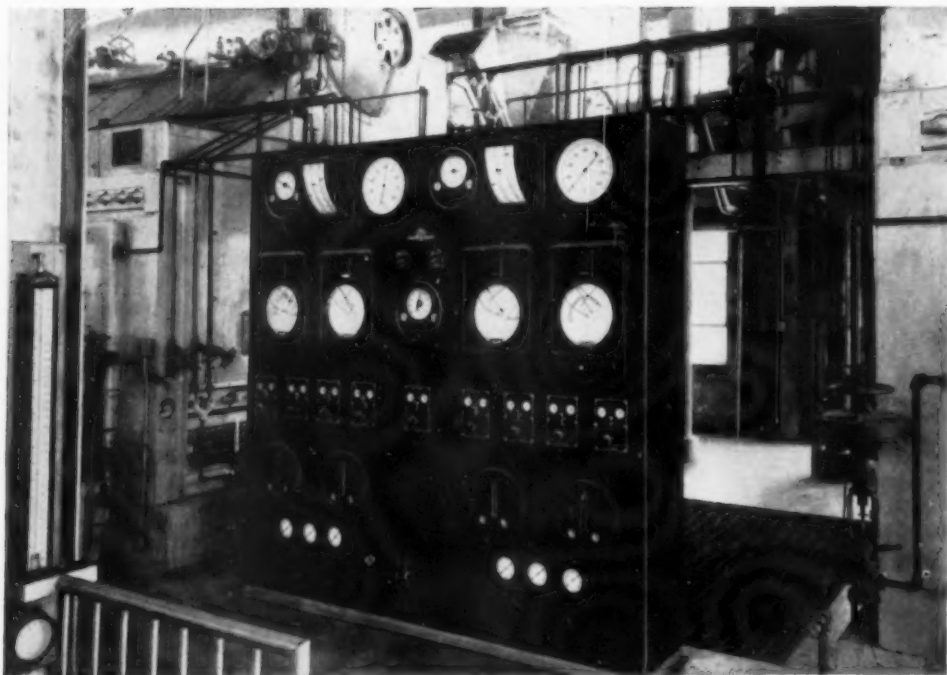
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Southern Power & Industry

The Industrial and Power Journal of the South and Southwest

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SOUTHERN POWER & INDUSTRY for JANUARY, 1960



Facts and Trends

January 1, 1960

- ◆ **POWERCASTING** — a new program to help utility management accurately forecast their long-range system needs — has been announced by Westinghouse. Utilities can find the optimum plan to follow in expansion, when to retire old turbines, how much to spend for reliability, and what spinning reserve policy to use.

The Powercasting program makes use of mathematical models that duplicate all or any portion of the utility system. Using a digital computer, actual day-by-day operation can be simulated over a long period, usually 20 years. All system variables: technical, financial, and human — both predictable and random — are taken into account.

- ◆ **STRUCTURAL PLASTICS** — An illustrated twelve page brochure describing use of reinforced structural plastics in screen assemblies for water intake gates is available from CTL, Division of Studebaker-Packard Corporation.

Case histories in the brochure relate savings in maintenance as well as the superiority of reinforced structural plastics over metal and concrete frames in tests during the last two years. While this data is particularly related to the steam power industry, it also indicates the potential that structural plastics offer all industry for corrosive and abrasive applications.

- ◆ **INSULATION TRACKING OCCURS** when electricity skips across the surface of electrical insulation, causing a short circuit. This is a serious problem in electrical apparatus, and is most serious where moisture and dust contaminate the surface of an insulating material.

Westinghouse has developed a new insulation coating that is claimed to stop tracking. It may be sprayed or painted on other insulations, where it bonds to form a new surface with outstanding physical, chemical and electrical characteristics. The new material is a resin of the epoxy type.

- ◆ **"LIQUID GLASS"** — in collapsible metal tubes is now available for industrial use in sealing electrical connections to prevent arcing, flash-over or short circuits caused by moisture.

The product, a silicone compound which coats or is packed around electrical connections and similar components, is packaged in a squeeze tube with nozzle to permit easy use. Nongumming, non-melting and noncorrosive, the silicone compound adheres immediately to most surfaces.

- ◆ **ALUMINUM HOUSING** — Announcement that Allis-Chalmers has begun production of an all-aluminum housing for outdoor switchgear heralds many other new applications for aluminum in the electrical industry, according to Reynolds Metals Company.

Developed jointly by Allis-Chalmers and Reynolds, the new enclosure is made of extruded aluminum sections which interlock to form structurally reinforced panels. This is an example of

(Continued on Page 6)

Which Water Treating Equipment Will Best Fit the Job?



This new 24-page bulletin will help you decide

See what it covers:

- Zeolite Water Softeners
- Demineralizers
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- Deionizers
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- Purifiers
- Degasitors
- Deaerating Heaters
- Water Treating Chemicals

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If you are confused about the many ways to treat water, this new bulletin will help you decide which is best for the job. It describes the various equipment used in treating water and what each is designed to do. Known for quality, dependability and advanced design, this equipment is based upon 50 years experience. For practical guidance in its proper application, the services of the Elgin representative nearest you is yours for the asking.

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Facts and Trends — Continued from Page 4

how the higher cost of aluminum is offset by cutting fabrication costs through the use of such labor-saving devices as extrusions, said J. C. Warford, manager of electrical equipment markets for Reynolds.

- ◆ "KILLING THE GOOSE . . ." — There is wide agreement among personnel executives that doctors, by charging higher fees to those who have health insurance, are partly to blame for skyrocketing medical care costs, according to a survey made by The Bureau of National Affairs, Inc.

Of 132 top executives representing firms in all branches of industry, nearly three-quarters stated that doctors hike fees and are more likely to order hospitalization when they know that an individual has insurance to help pay the bill.

- ◆ CHEAPER SILICONES — Major reductions in the price of silicone defoamers, greases, and greaselike dielectric compounds have been announced by Dow Corning Corporation. The new reductions range up to thirty cents a pound even for nominal quantity lots.

These new price reductions which vary from 5 to 8% are virtually across the line for silicone greases, greaselike compounds, defoamers and their emulsions. Silicones are becoming firmly established commodity items for processing plants and manufacturers of chemicals, foods, drugs and beverages; paint and plastic formulators; petroleum refiners; textile dyers; and rubber compounders.

- ◆ FOAM — A compact, virtually fool-proof do-it-yourself kit for mixing urethane foam is now available. Packaged by the Dayton Rubber Company, the kits contain pre-mixed chemical components capable of creating lightweight rigid urethane foam to fill areas as small as a cubic foot.

This particular formulation is uncomplicated and comparatively easy to work with. It is extremely simple to prepare. A sealed can containing a pre-measured chemical serves as the mixing container. The user merely combines and stirs the components in accordance with instructions prior to pouring into the mold or void. The material expands to 30 times its original volume within ten minutes.

- ◆ NEW TOOL BURNS THROUGH CONCRETE — A new tool (Oxweld ACL-4 Powder Lance) developed by Linde Company, Division of Union Carbide Corporation, is capable of cutting through concrete, metal or any other known hard material of any thickness.

Lengths of standard black iron pipe are fitted to the front of the ACL-4, which is connected to an oxygen supply and a source of special Oxweld metallic powder. Oxygen and powder are carried to the material being pierced or cut by the consumable pipe. This mixture is ignited at the end of the iron pipe, producing an extremely high temperature reaction, estimated at approximately 8,000 F.

- ◆ LIGHTNING BUGS REPLACED — A lamp small enough to pass through the eye of a darning needle has been placed into production by Sylvania Lighting Products.

The new microminiature lamp, called the Sylvania Mite-T-Lite, has immediate applications in transistorized circuits in missiles, computers and electronic systems. The body of the lamp is cylindrical with a nominal diameter of .040 inches and length

(Continued on Page 10)



Which **Bearing** should you buy?

—They're dimensionally interchangeable, but dimension is only one of many factors to consider. At left, is a super-precision bearing, made to the most critical specifications and good for thousands of trouble-free hours of service in the proper application. This bearing is a waste of money and often a source of trouble in less demanding applications.

At right, a standard bearing suitable for applications where preload, run-out and tolerances are not too demanding.

Which should you buy? Let our bearing engineers help you. When you buy super-precision from Dixie Bearings,

Inc., you get super-precision bearings in the manufacturers' original boxes — factory-fresh and incorporating the latest improvements. They are usually carried in stock and delivery is immediate.

If a standard bearing is best, you will get it fast from Dixie Bearings, Inc. And above all, when your Receiving Department checks the bearings received against your purchase order, you'll find you have received what you have ordered—exactly with no "just as good" substitutions!

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S. CAROLINA: Greenville • **TENNESSEE:** Chattanooga • Kingsport • Knoxville • Nashville
VIRGINIA: Norfolk • Richmond

Modern use of coal cuts fuel costs 22%

In addition, coal costs Uniontown
Hospital \$3.00 per ton less than gas!

Expansion of facilities at Uniontown Hospital, Uniontown, Pa., increased the demand for steam used for space heating, water heating, kitchen, laundry and sterilizing equipment. An engineering survey was conducted which indicated the need for a new plant rather than modernization of the old one. Hospital officials—working with Altman and Altman, Architects, and Paul S. Park, Consulting Engineer—decided to install a completely automatic steam plant. Coal continues to be used because it meets the hospital's rigid standards for cleanliness and has proved the most economical fuel. Not only has burning coal this modern way shown a 22% savings in fuel costs compared to the old plant but, per equivalent ton, coal actually costs \$3.00 less than its nearest competitive fuel!

COAL IS LOWEST COST FUEL

Today, when the annual cost of fuel often equals the original cost of the boilers, you should know that bituminous coal is the lowest cost fuel in most industrial areas. And modern coal-burning equipment gives you 15% to 50% more steam per dollar, while automatic operation trims labor costs and eliminates smoke problems. What's more, tremendous coal reserves and mechanized mining procedures assure you a constantly plentiful supply of coal at stable prices.

CONSULT AN ENGINEERING FIRM

If you are remodeling or building new heating or power facilities, it will pay you to consult a qualified engineering firm. Such concerns—familiar with the latest in fuel costs and equipment—can effect great savings for you with the efficiency and economy of coal.

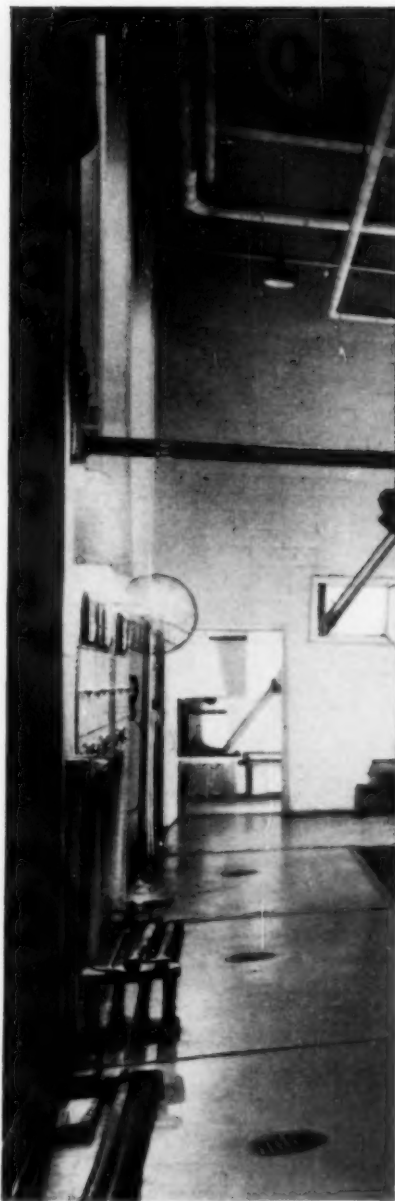
TECHNICAL ADVISORY SERVICE

To help you with fuel problems, the Bituminous Coal Institute offers a free technical advisory service. We welcome the opportunity to work with you, your consulting engineers and architects. If you are concerned with steam costs, write to address below or send coupon. Ask also for case histories booklet, complete with data sheets. You'll find them informative.

BITUMINOUS COAL INSTITUTE

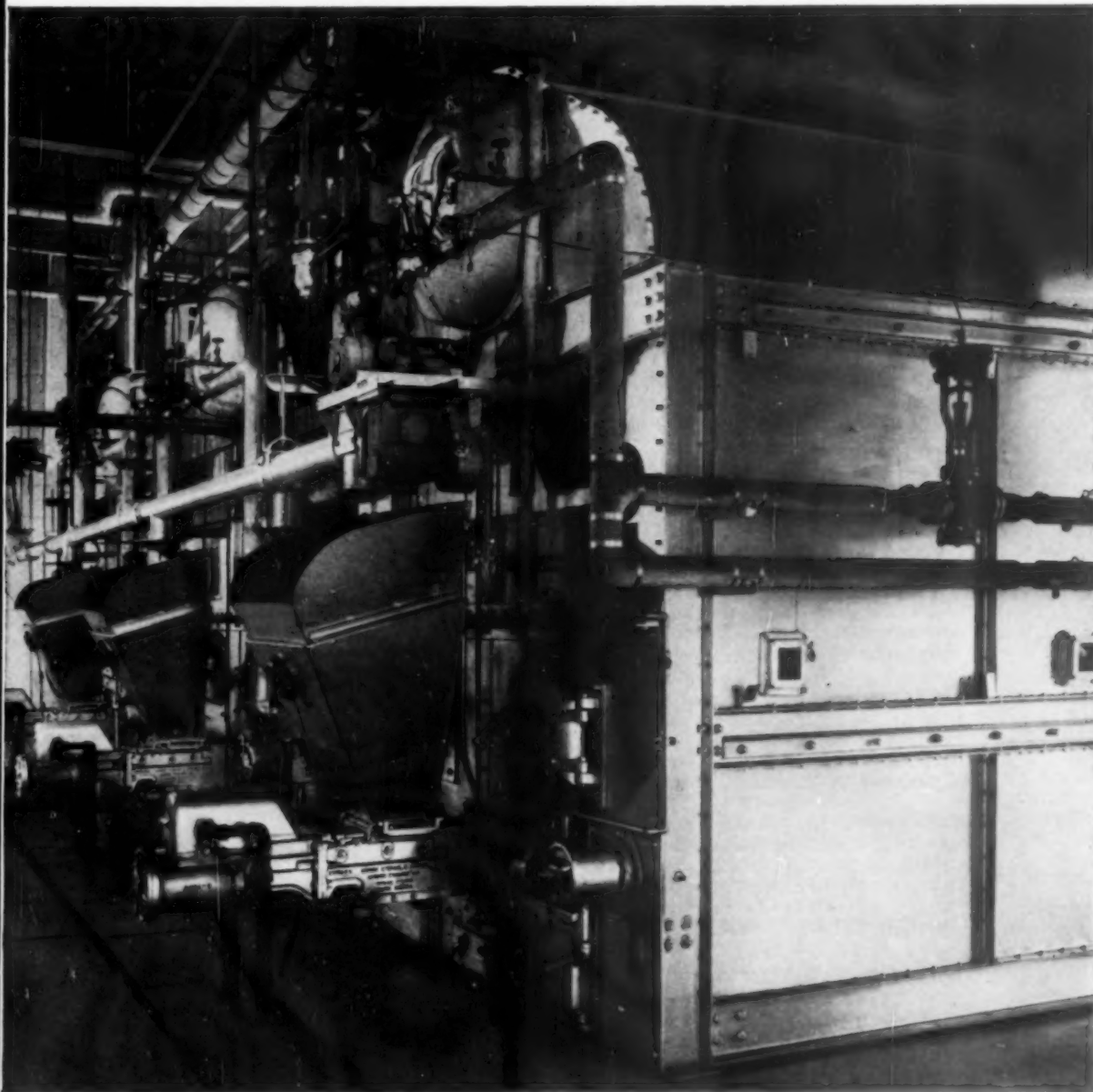
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See our listing in Sweet's Files: A-30J/Bi; PE-4a/Bi; IC-18b/Bi

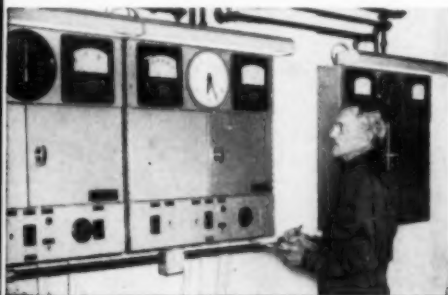


Coal is discharged into bin and gravity fed into hopper box, then moved by inclined screw conveyor into horizontal screw conveyor leading to stoker hoppers and boilers. Boilers are Keeler 10,000 lb/hr "CP" type units, 150 psi. Coal handling system by Auburn Foundry Company.





The completely enclosed electric-type combustion control panel (Cleveland Controls, Inc.) contains assembly units for all power control and coal handling operations. Steam flow meters, strategically located throughout the hospital, enable the operating personnel to determine any variable in load conditions.



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and boiler room plans:

Bituminous Coal Institute
Southern Building, Washington 5, D. C.

Gentlemen: Please send me:

- ☐ GS-1 (low-pressure heating plant, screw-type underfeed stoker).
- ☐ GS-2 (high-pressure heating and/or process plant, ram-type underfeed stoker).
- ☐ GS-3 (automatic package boiler for heating and process plants).
- ☐ Case histories on larger plants.

Name _____

Title _____

Company _____

Address _____

City _____ Zone _____ State _____



Facts and Trends — Continued from Page 6

is 0.125 inches. The lamp leads are platinum in a diameter of 0.005 inches. The filament is 0.00025 inch tungsten wire of approximately 30 turns.

- ◆ **RUBBER** — World production of synthetic rubber will more than double in the next ten years as production of natural rubber stays about at current levels, according to G. R. Vila, vice-president of United States Rubber Co.

By 1970, world-wide rubber consumption is expected to increase by two-thirds to about 7 million long tons. At the same time, natural rubber production can be expected to level off at 2 to 2.3 million tons annually, largely because of insufficient replanting. Mr. Vila pointed out that although Indonesia is currently the world's largest supplier of natural rubber, less than 10 per cent of the total acreage of its rubber estates have been replanted since 1945.

- ◆ **SQUARE STEEL TUBING** — New design freedom is provided by factory-fabricated square and rectangular structural steel tubing. The product is made by Espro Tubing Division of Union Asbestos Rubber Company.

Popular industrial applications include boom sections, trailers, conveyors, crash railings, and area lighting. Smooth exterior surfaces on all four sides of the tubing are easy to paint, and do not hold dust. Espro rigid box structures are available nationally through tubing distributors in girths ranging from 12 inches to 48 inches, and in wall thicknesses of 1/8 to 1/2 inch.

- ◆ **ENGINEERS** — "Proceedings of the First Florida Conference, Utilization of Engineers and Scientists," sponsored by the Florida Engineering Society and the Florida Engineering and Industrial Experiment Station, Leaflet No. 12.

The papers given at the conference cover administrative and professional advancement of engineers and scientists, effective utilization of technicians and why improved utilization is a necessity for employers and professional employees. For a copy write the Florida Engineering and Industrial Experiment Station, Gainesville.

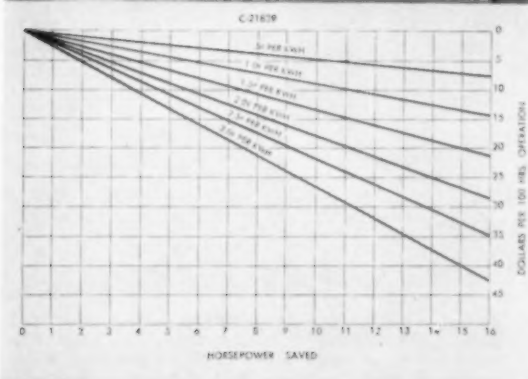
- ◆ **SONIC FILTER CLEANERS** — A new weapon in the battle against air pollution has been developed by Fuller Company, Catasauqua, Pennsylvania. Sonic generators of low audible frequency are used to clean glass filter bags which catch dust and corrosive fumes from industrial plants. The bags are cleaned by an undulating motion, without flexing.

The Dracco "Sonoclean" glass bag filter system eliminates need for extensive shaking mechanism with supporting members, bearings, and motors. The new design is recommended by the manufacturers for both hot dry gases and low temperature gases.

- ◆ **FOIL COILS** — The first large-scale application of aluminum foil strip conductor in a volume production coil was recently announced by Reynolds Metals Company. A large automobile horn manufacturer has switched from copper and aluminum magnet wire coils to interleaved aluminum strip conductor coil units.

Engineers report that paper interleaving of the aluminum strip cuts insulation costs while providing higher dielectric strength. Costly impregnating and baking — a must for wire coils — are eliminated, and electrical connections are greatly simplified.

Write the editors for additional information on any of the above items.
SOUTHERN POWER & INDUSTRY. 806 Peachtree St., N.E. Atlanta 8, Ga.



How do you know when you need a new pump?

"One way is to
calculate power saving,"
writes Phil Olmstead,
Chief Engineer,
Goulds Pumps, Inc.



If your *needs* have changed since you installed your present pump, or . . .

If *efficiency points* have changed due to deposits building up in your piping, or . . .

If your present pump is *frequently under repair*, then . . . it's about time you began thinking about getting a new pump!

That's a pretty good rule of thumb to go by when the time comes to consider replacing an old pump with a new, efficient unit. But you don't have to rely merely on rules of thumb—you can actually *calculate* the power saving a new pump will bring you. Let me illustrate:

Only recently I discussed and demonstrated power saving with an engineer friend of mine. He had a pump that he had purchased five years ago. At that time its efficiency was high . . . but changing conditions led to reduced efficiency. According to the pump curve, its efficiency had dropped to 73 per cent: 600 gallons per minute @ 240 total dynamic head (pressure).

To prove a point, we went through the Goulds catalog and found a pump with the same rating but which was 82% efficient.

Next we merely applied the following formula to determine the brake horsepower:

$$\text{BHP} = \frac{\text{Gallons per Min.} \times \text{Total Head in feet}}{3960 \times \text{Pump efficiency expressed as a decimal}}$$

*Horsepower conversion figure (foot-pounds to gallons per minute)

This is what we got:

$$\begin{array}{l} \text{OLD PUMP:} \quad \frac{600 \times 240}{3960 \times .73} = 49.8 \end{array}$$

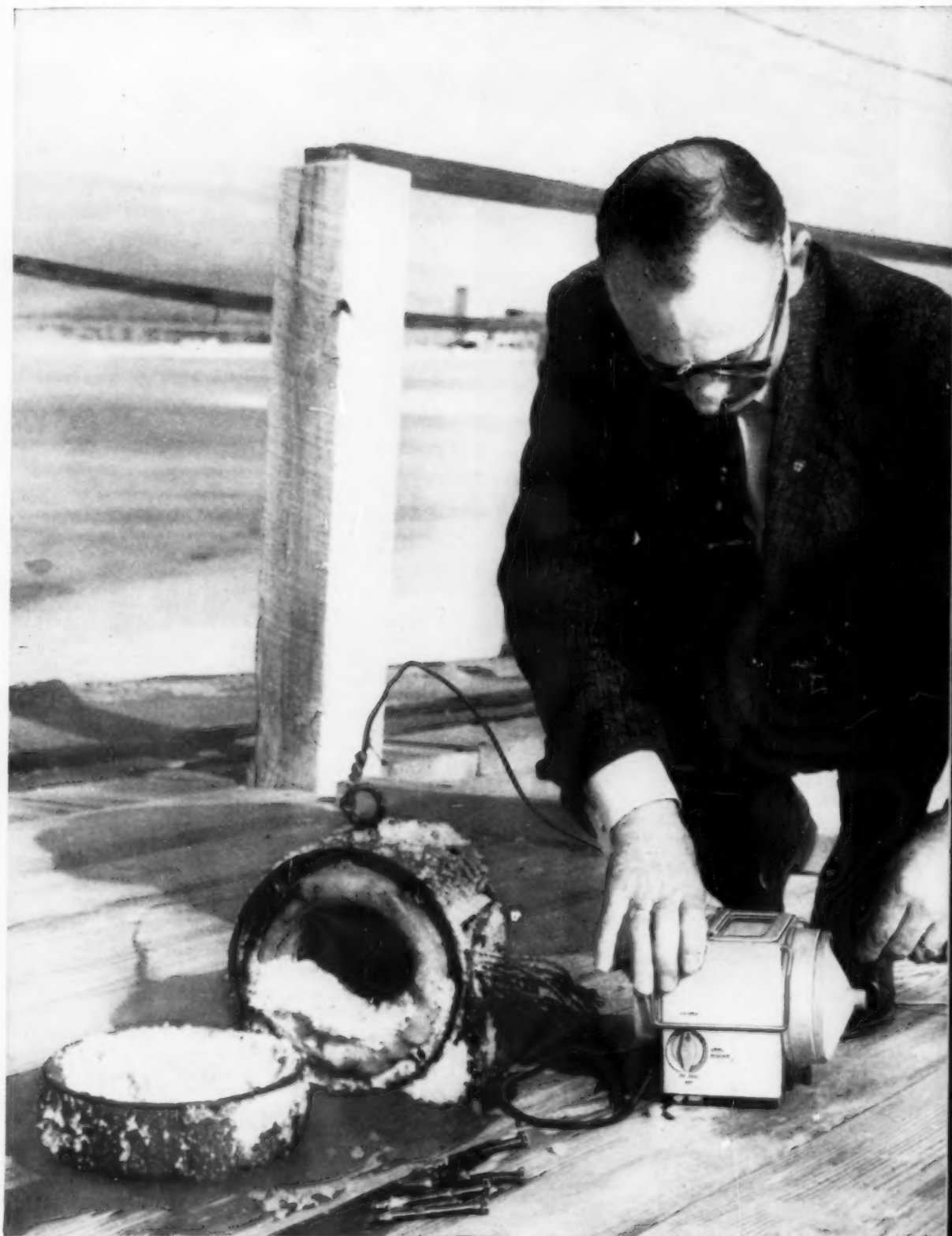
$$\begin{array}{l} \text{NEW PUMP:} \quad \frac{600 \times 240}{3960 \times .82} = 44.3 \end{array}$$

$$\text{HP SAVED:} \quad 5.5$$

Now check the savings chart illustrated on this page. Follow the "HP saved" line to the electric current rate line—in this case, 2¢ per KWH. The savings per 100 hours of operation would be approximately \$10. At, say, 10 hours a day, 300 days per year, my friend saw that he would be saving around \$300 with a new pump.

Try it for *your* pump. Calculate how much you would save with a new Goulds pump replacing your old one. Then call in a Goulds application engineer to talk it over and determine the *right* one for your needs. Or drop a line to me, Phil Olmstead, at Goulds Pumps, Inc., c/o Dept. SPI-89, Seneca Falls, New York, and I'll see that you get the information you need.

GOULDS  **PUMPS**



Checking out the Super COILIFE protected stator after being submerged for 99 days in Great Salt Lake. This stator will be on display at Booth 1010 at the Plant Maintenance Engineering Show, Philadelphia, January 25-28.

Super COILIFE Triumphs Over Motor-Killing Brine Throughout 99-Day Endurance Test in Great Salt Lake

A Westinghouse stator recently spent 99 days of continuous torture at the bottom of Great Salt Lake. The salinity of the water averages 27% by analysis. Other than to rapidly gather salt until it was completely buried, the Super COILIFE® winding shrugged off the entire indignity. This Super COILIFE encapsulated unit meggered "infinity" . . . performance was identical to the pretest reading of the rewound motor.

This unprecedented torture test in the lake was not the only punishment inflicted upon this same motor. The river boat Sprague, over a period of 432 hours, had towed it underwater 1500 miles from Vicksburg, Mississippi, to Pittsburgh, Pennsylvania. In neither case was the Super COILIFE insulation affected by these rugged tests.

Acids, alkalis, oil, dirt and other contaminants are just as effectively . . . and permanently . . . stopped by

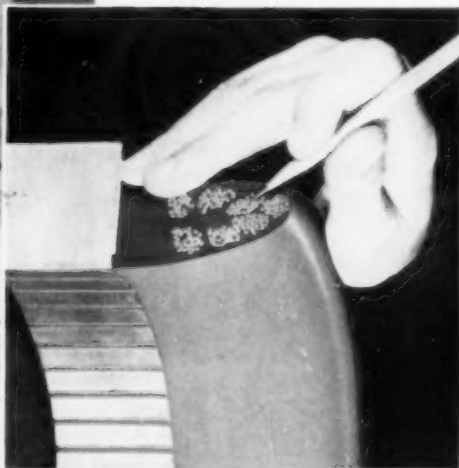
Super COILIFE. A solventless epoxy is responsible for this extraordinary property of the insulation. Super COILIFE is thermally stable, chemically inert and stays elastic in response to thermal cycles of the windings. The exclusive process of applying Super COILIFE accurately controls the predetermined thin wall of the encapsulation for maximum dissipation of heat from windings. The surface will not crack or craze under severe operating conditions.

Super COILIFE is available only from Westinghouse Repair plants. Specify it for the rewinding and modernization of your motors to extend motor life and to protect your original investment.

For more information call your Westinghouse Representative, or write for Booklet B-7622 to Westinghouse Electric Corporation, P. O. Box 868, 3 Gateway Center, Pittsburgh 30, Pa.

J-95210

*Trade-Mark



Exclusive encapsulation process carefully controls the thin wall of Super COILIFE insulation . . . permits maximum heat dissipation, eliminates failures from contamination.



Stator being dragged from 99-day-long briny bath . . . since stator was inoperative during this entire period, Super COILIFE again has proved its ability to protect the windings from salt water and other contaminants.

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the SOUTH—SOUTHWEST

more power . . . more plants . . . more money



Owens-Corning Building Textile Plant — Aiken, S. C.

Owens-Corning Fiberglas Corporation, Toledo, Ohio, is starting construction of a multimillion dollar Fiberglas textile yarn plant in Aiken, S. C. The company already has a plant at Anderson, S. C., which is the largest of its kind in the world.

The new plant, which will have the most advanced processing equipment for fibrous glass textile materials, is located on a 350-acre site between U. S. Highway 78 and State Route 215, adjacent to the Southern Railway, three miles east of Aiken.

Construction is expected to be completed by the third quarter of 1960. Initial production for the first units is scheduled for June, 1960. Plant employment is expected to be 900 in the early stages and to reach about 1,200 when full operation is achieved. The Daniel Construction Company of Greenville, S. C., is the general contractor.

New Office Building for Western Electric — N. C.

The Western Electric Company, Winston-Salem, N. C., has signed a 10-year lease on a new office building to be constructed by the Mary Reynolds Babcock Foundation on the northwest corner of Reynolds

Road and the proposed Silas Creek Parkway. The two-story brick structure, containing 200,000 sq ft of floor space and having ample parking facilities, will accommodate approximately 1,500 people. Completion is expected early in 1961, when the building will be occupied by the company's field engineering and technical publications departments.

Long-Range Expansion for Radiation Inc. — Florida

To meet existing and anticipated needs for additional engineering, manufacturing and administration facilities, **Radiation Incorporated**, Melbourne, Florida, has undertaken a long-range expansion program.

The company acquired a 60-acre tract five miles south of the original Melbourne facility and an option on an adjacent 60 acres. The new plant complex consists of a group of medium-size buildings, called "Engineering Modules." Each module will have 22,000 sq ft of work space. The administration building will serve as National Headquarters for Radiation.

An initial total of 103,000 sq ft will be occupied by January, 1960. Investment at this stage of the program will be approximately \$1,228,000. The company plans to maintain its operations at its Orlando facility and in California.



Armstrong Cork Expansion Progresses at Macon, Ga.

Construction of a new 88,000 square foot fabricating building at the Armstrong Cork Company's fiberboard manufacturing facilities in Macon, Georgia is nearing completion. The new building, part of an extensive plant expansion pro-

gram, will house additional fabricating and finishing equipment used in the manufacture of Armstrong Cushiontone and Temlok ceiling products. Construction is also scheduled to begin on a new warehouse at Macon as soon as the necessary steel becomes available.

(Continued on Page 16)

KELLOGG ENGINEERS

BUILD LONG LIFE

INTO POWER PLANTS

With costs of downtime constantly climbing, the soundest investments in new central stations today are those engineered for optimum protection against failure tomorrow.

This is one of the reasons why The M. W. Kellogg Company, world-wide engineers and builders of plants for basic industries, is so frequently charged with the execution of large capital expenditures by electric utilities—one industry vital to all.

In central stations functioning 24 hours every day, a major Kellogg responsibility is to install and weld the hundreds of feet of heavy-walled main steam lines that keep steam flowing to the turbines, as well as

much of the auxiliary piping.

Through Kellogg's metallurgical background and the company's development of special field-welding techniques, the security of Kellogg K-Welds® on stainless, chromemoly, and high quality carbon steel piping is assured for the life of the steam generating system.

Kellogg's role in the erection of one major utility's newest power station is fully described in the 12-page booklet—"The Eddystone Story." Inquiries for this booklet are invited from consulting engineers, engineers of power generating companies, and manufacturers of boilers, turbines, and allied equipment.



THE M. W. KELLOGG COMPANY

711 Third Avenue, New York 17, N.Y. *A Subsidiary of Pullman Incorporated*

Offices of Kellogg subsidiary companies: Toronto, London, Paris, Buenos Aires, Caracas, Rio de Janeiro





New Branch Building for Noland Co. — Chattanooga

The new building of **Noland Company** at 1724 Central Ave., Chattanooga, Tenn., is the second largest of the company's 37 branches. Design provides for efficient handling of all material and equipment. Warehousing is palletized, and arranged with wide, plainly marked aisles for easy access to stock. Receiving and shipping departments are complete-

ly separated, and an observation office affords the warehouse manager a view of the city counter, warehouse, loading platform and pipe shed.

The structure also houses the main office of the company's Machine Tool Division, with the showroom under supervision of G. T. Richardson. The Noland Company has had a branch in Chattanooga for more than 20 years. J. S. D. Stovall is manager of the operation,

Evans Builds Plastic Pipe Plant — Florida

Evanite Plastic Co., a subsidiary of the Evans Pipe Co., Uhrichsville, Ohio, is building a new plastic pipe plant on a 30-acre site at Leesburg, Fla. The new plant is expected to be in operation Feb. 1, 1960. Estimated cost is in excess of \$200,000.

The Florida plant will be a plastic extrusion facility and will manufacture, primarily, eight-inch plastic sewer main and four- and six-inch plastic house sewer connections.

Monsanto Plastics Div. Expands Texas Facilities

Monsanto Chemical Company plans to increase production of styrene monomer by at least 200 million pounds a year. The first stage of the new facilities, to be located at Texas City, Texas, is expected to be in operation by the first quarter of 1961.

The additional capacity is to help supply the increasing demand for

styrene monomer by the synthetic rubber industry and other consuming industries, as well as the accelerating needs of the company's own styrene plastics operations. Styrene is a building block for polymers of utility and economy in such markets as packaging, construction, automobiles, appliances and records. Monsanto is preparing for substantial new styrene penetration into these and other important end-uses during the next few years.

Lone Star Cement Corp. Expands Norfolk Plant

A \$6.5-million expansion of the Norfolk plant of the **Lone Star Cement Corporation** is in progress. The program includes the addition of a 1-million-barrel kiln, increasing the productive capacity of the plant to 2.3-million barrels per year.

This expansion marks a new phase in Lone Star's continuing effort to provide adequate cement supply for the ever-growing needs of various market areas.

PLANT PERSONNEL

James M. Gloor, who joined Tube Turns Division of Chemetron Corp. in 1951, has been promoted to works manager for the main plant at Louisville, Ky., freeing **John A. Henby**, vice-president in charge of production, for new responsibilities related to manufacturing operations. **Henry H. George**, who has been with the company since 1944, has been appointed chief engineer, product engineering and research department.

Diamond Alkali Company's Electro Chemicals Division has transferred **John H. Fonner, Jr.**, from the Muscle Shoals, Ala., plant to Edgewood, Maryland, as assistant plant manager. **Erich G. Schlaile**, formerly at the Edgewood plant, is now at Diamond's Deer Park, Texas, plant as process engineer.

General manager of the new Hoerner Boxes, Inc., plant at Tupelo, Miss., is **Forrest R. Hamilton**. **Carl Schmidt** is superintendent, and **Philip Cosgriff** is office manager.

Richard MacPherson will be manager of the new Owens-Corning Fiberglas plant to be built at Aiken, S. C. Project engineer will be **Jerry B. Holschlag**, formerly Ashton plant manager and engineer for the Anderson, S. C., plant. **Bonner Manly**, a native of Greer, S. C., will be personnel director.

Plant manager for the newly organized Overly Manufacturing Company of Missouri, Inc., St. Louis, is **Ralph Yeskey**, who was formerly in the plant lay-out and engineering department of the parent company.

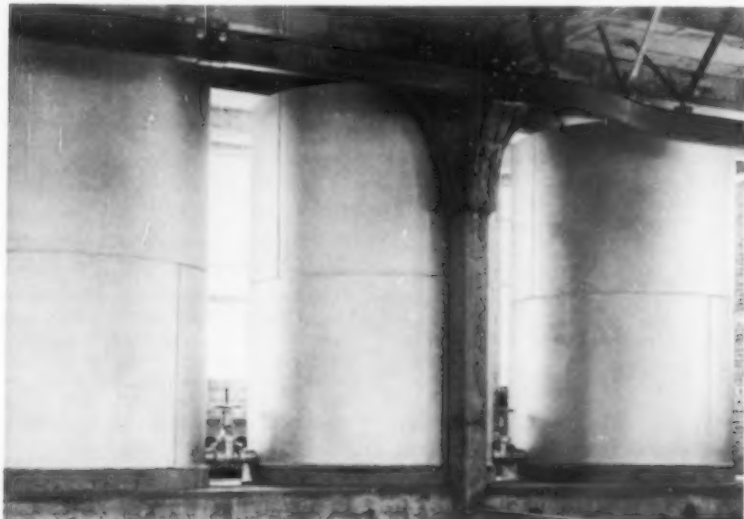
William G. Cole is manager of Ferro Corporation's Fiber Glass Division at Nashville, Tenn., where a multi-million dollar expansion program is underway.

Dr. Chwan-Chang Lee, who received his Ph.D. in Electrical Engineering from the University of Texas, will direct Temco's new radiation system laboratory at Garland, Texas.

(Continued on Page 20)

BYERS GUIDE

Maintenance and Operating Tips from A. M. Byers Company VOL. 1 NO. 4



These welded Wrought Iron tanks, 9' dia. by 12' high, were installed in 1936 in the chlorine storage building at the Coney Island Sewage Disposal Plant, Brooklyn, N. Y. Steam heating coils suspended in the caustic tanks are also Wrought Iron. During all these years, not a nickel's worth of replacement was needed.

4-D Wrought Iron Curbs Corrosive Caustics, Lasts 2-4 Times Longer Than Other Metals

Two types of metal deterioration prevalent in caustic soda handling have been effectively curbed by 4-D Wrought Iron. Let's discuss the nature of this deterioration and consider an economical remedy.

Caustic embrittlement stymied

This is an intergranular type of stress corrosion. Sounds the death knell for many metals. Cracks suddenly develop along the grain boundaries of the metal. There's little or no warning. They occur on exposure to heated caustic solutions, usually in areas where the metal has been stressed.

Crevice where caustic tends to concentrate are also particularly vulnerable to attack. Service reports indicate that 4-D Wrought Iron possesses excellent resistance to this type of corrosion.

Normal corrosion stalemated too

This is a loss-of-metal type of deterioration. You run into this

particularly when the metal's exposure to caustic soda is interrupted by periods of exposure to air, water or neutral solutions. Severity of corrosion depends on temperature and concentration. Over 250,000 glasslike iron silicate fibers per cross sectional square inch of 4-D Wrought Iron—distributed throughout the highly refined base metal—help halt and diffuse corrosive attack.

Heated, concentrated caustics tougher on most ferrous metals

Heated and/or concentrated caustic solutions become increasingly corrosive to most ferrous metals. It takes a silicate-based metal like 4-D Wrought Iron to combat this type of corrosion effectively. That's why design and maintenance engineers are turning more and more to 4-D Wrought Iron pipe and plate for caustic soda heating tanks and heating piping used in caustic processes. Clip coupon for case history service reports.

In Nuclear Equipment 4-D Does Not Distort Radiation Measurement

Manganese and carbon become excited or "stay alive" in a radioactive environment. 4-D Wrought Iron's low manganese and carbon content and low total metalloid content enable it to perform mechanical functions in nuclear processes without distorting radiation measurement. Check corresponding box in coupon for more information.

Manganese Wrought Iron Resists Impact When Cold

A new specialty wrought iron has been developed for use as an economical, impact resistant metal for low temperature design.

You can use Mn Wrought Iron in the petroleum, chemical and refrigeration industries and others in which brittle failure is giving trouble. It's available in pipe, plate, other forms. Clip coupon for details.

Lower Tubing Costs

Cold drawn 4-D Wrought Iron heat exchanger and condenser tubing is virtually unaffected by ammonia, carbon dioxide and Freon. 4-D tubing lasts longer than steel in salt water, heat transfer brines, and industrial cooling waters. In most tubing applications, 4-D costs less per foot per year of service than other tubing materials. Check coupon for proof.

A. M. Byers Company
Product Development Department
Clark Building, Pittsburgh 22, Pennsylvania

Please send data on items checked:

- ☐ Caustic Soda Handling
- ☐ Nuclear Process Equipment
- ☐ Mn Wrought Iron
- ☐ Condenser and Heat Exchanger Tubing
- ☐ PVC Pipe for Machine Tool Equipment
- ☐ Colorized Wrought Iron
- ☐ Laboratory Test Results
- ☐ Block Rock Construction

Name _____ Title _____

Company _____

Address _____



BYERS GUIDE

Maintenance and Operating Tips from A. M. Byers Company

page 2



Hex bar fits snugly in feed rack after liner is in place, so that no adhesive bonding agents are necessary.

New Design Idea* Muffles Noisy Machine Clatter

A new idea for muffling the clatter of machine tool equipment while in operation has been developed by A. M. Byers Company.

Recently a patent application* was made for the new idea which involves lining the bar guide or feed rack on automatic screw machines, turret lathes, etc. with PVC Pipe.

Noise is virtually eliminated and nicking or scratching of bar material is impossible. Some manufacturers have found that the metal feed rack can be replaced with PVC entirely on certain equipment such as engine lathes.

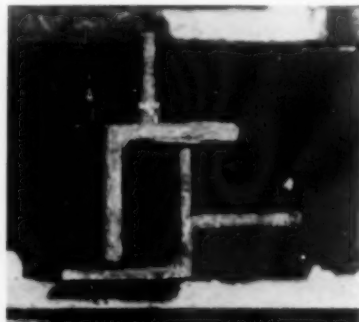
The original test installation of PVC Pipe in this application has been going strong for 10 months with no sign of trouble. And the cost of lining or replacing the feed rack with PVC Pipe is phenomenally low. It's less than \$5.00 on single feed machines.

For more details on this one, check the coupon and mail to us.

*Patent pending, A. M. Byers Company

Soot-Blowers Use 4-D To Combat Oxidation

Blowing soot with steam or air tests the temper of the toughest metals. Oxidation is a constant threat, especially to fire tubes. Some metals flunk such hot-again, cool-again tests of endurance. But not 4-D Wrought Iron. 4-D can be furnished *calorized* to resist corrosion at high temperatures (1000—1600°F) prevalent in this service. Fill out coupon for more details.

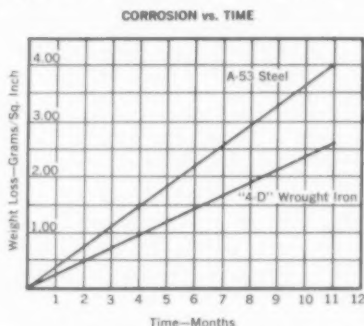


This unretouched photo shows a comparison of 4-D Wrought Iron and steel after in-service testing at Mercier Brick Company, Dearborn, Michigan. That's 4-D Wrought Iron on top. Steel angle rests directly underneath. Both of these angles were 1/4-inch thick when placed in service, side by side on the same rack.

Lower Corrosion Rate For 4-D Wrought Iron

Data for 4-D Wrought Iron and steel plot as virtually straight lines, with 4-D Wrought Iron having a lower slope or rate of attack. Curves will flatten with time.

These data indicate that the 4-D Wrought Iron curve will continue to flatten at a lower rate than the steel curve. Other 4-D Wrought Iron test results are available on request. Please refer to coupon.



Here is a comparative laboratory analysis of corrosion losses in aerated salt water. Tests were conducted by A. M. Byers Company metallurgists.

Concrete Block Racks: Which Metal Lasts Longer?

If you guessed 4-D Wrought Iron over steel, you're 100% correct. After 11 months—101 cycles—the 4-D Wrought Iron angle has retained its original thickness. But the steel angle has already lost more than half of its original thickness due to extreme flaking and disintegration from corrosion. 4-D Wrought Iron's resistance to corrosive elements in block production processes is characterized by a hard, impregnable surface shield which cannot be flaked. Even with blows from a hammer. You be the judge. Which metal would you use in concrete block rack service? Send coupon for new booklet, "Modern Concrete Block Rack Construction."

For additional information on 4-D Wrought Iron, Contact Byers Division Offices in the cities listed below.

The maintenance and operating items appearing in BYERS GUIDE #4 were prepared by the Engineering Service Department of



A. M. BYERS COMPANY

Pittsburgh 22, Pennsylvania

ATLANTA • BOSTON • CHICAGO • HOUSTON • NEW YORK • PHILADELPHIA
PITTSBURGH • ST. LOUIS • SAN FRANCISCO • WASHINGTON, D. C.

4-D Wrought Iron is immediately available and may be obtained through established distributors of Wrought Iron Pipe. Plate, bar, and other flat rolled products may be ordered direct.

Corrosion costs you more than Wrought Iron

"CHARTS"

By SOUTHERN POWER & INDUSTRY gives quick solutions for everyday problems.

This 74-page, 7x10" Manual Serves the Needs of Plant Engineering-Operating and Maintenance Personnel.

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Name

P. O. Box or

Street and No.

City

State

Classification date—If an individual, give name of firm connected with and title of position.

Firm

Position

Products manufactured or nature of business

New Linde Oxygen Plant to Serve Southwest

Union Carbide Corporation's Division, **Linde Company**, will add another link to its chain of liquid oxygen-nitrogen producing plants being built primarily to supply missile installations with cryogenic fluids. The new multimillion dollar plant will be located near the missile engine production facilities at Fort Crowder Reservation, Neosho, Mo.

The new plant will be capable of producing 135 tons a day of liquid oxygen and nitrogen. Engineering work has been completed and it is expected that the plant will be operating in about one year.

Liquid oxygen and liquid nitrogen will be delivered to Fort Crowder and other industrial users throughout the Southwest by means of Linde's "Driox" oxygen system. An important feature of this system is the special insulated containers which can efficiently hold cryogenic liquids for long periods at temperatures below minus 300 degrees Fahrenheit. Tank trucks and railway tank cars will be filled with oxygen or nitrogen at the Neosho plant, and will deliver their liquid loads to storage tanks on users' property.

Ferro Expansion — Tenn.

A \$2,700,000 expansion of **Ferro Corporation's** Fiber Glass Division at Nashville, Tenn., was announced by William G. Cole, manager of the division. The increased facilities will include an additional glass smelting tank, fiber-producing bushings, fabricating machines, and warehouse area. The expansion program, which is expected to be completed by late 1960, will begin upon completion of the current \$700,000 plant expansion, and will increase by 75% Ferro's fiber glass-producing capacity.

The increased facilities are part of an accelerated expansion program by Ferro which is designed to meet the critical shortage of fiber glass reinforcing materials now facing the plastics industry. It is the third major expansion of the division in less than two years and will bring to \$4,000,000 the total amount invested in fiber glass production in a three-year period.

FUTURE EVENTS of Engineering Interest

Jan. 25-28: Plant Maintenance & Engineering Show, Convention Hall, Philadelphia, Pa. Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

Jan. 25-29: Seminar on Standardization, American Standards Association, Engineering Societies Bldg., New York, N. Y. Dr. John Gailard, 135 Old Palisade Road, Fort Lee, N. J.

Feb. 1-4: 2nd Southwest Heating & Air-Conditioning Exposition, Dallas, Texas. E. K. Stevens, Pres., International Exposition Co., 480 Lexington Ave., New York 17, N. Y., Mgr.

Feb. 1-4: Instrument-Automation Conferences & Exhibits, Instrument Society of America, Rice Hotel & Sam Houston Coliseum, Houston, Texas. John Johnston, Jr., Pres., ISA, 313 Sixth Ave., Pittsburgh 22, Pa.

Feb. 1-5: 4th National Industrial Electric Heating Conference, Cincinnati, Ohio. The Industrial Electrification Council, 750 Third Ave., New York 17, N. Y.

March 6-8: Southern Safety Conference & Exposition, Robert Meyer & George Washington Hotels, Jacksonville, Fla. W. L. Groth, Exec. Dir., Southern Safety Conference, Inc., P. O. Box 8927, Richmond 25, Va.

March 6-9: ASME Gas Turbine Power & Hydraulic Conference, Rice Hotel, Houston, Texas. Amer-

ican Society of Mechanical Engineers, 29 W. 39th St., New York 18, N. Y.

March 29-31: 22nd Annual American Power Conference, Hotel Sherman, Chicago, Ill. R. A. Budenholzer, Conference Director, Mechanical Engineering Dept., Illinois Institute of Technology, 3300 Federal St., Chicago 16, Ill.

April 18-20: Southern Metals Conference, American Society for Metals, Tutwiler Hotel, Birmingham, Ala. J. R. Kattus, Chm. '60 SMC, Southern Research Institute, 2000 Ninth Ave. South, Birmingham, Ala.

April 20-22: Symposium on Instrumentation for the Process Industries, Chemical Engineering Dept., Agricultural & Mechanical College of Texas, College Station, Texas.

April 26-28: 41st Annual Convention & Welding Exposition, Biltmore Hotel & Great Western Exhibit Center, Los Angeles, Calif. Information Center, American Welding Society, 33 W. 39th St., New York 18, N. Y.

April 27-29: Sixth Annual Instrument Society of America Conference and Exhibit, and First Pulp and Paper Division Symposium, Pensacola, Florida. G. W. Howlett, P. O. Box 4426, Pensacola, Florida.

May 9-13: 2nd Southwestern Metal Exposition & Congress, American Society for Metals, State Fair Park & Sheraton Hotel, Dallas, Texas. Allan Ray Putnam, Mgr. Dir., ASM, Metals Park, Novelty, Ohio.

New Airco Unit to Supply TC&I — Fairfield, Ala.

Plans for the construction of a new air separation plant to supply oxygen by pipeline to the **Tennessee Coal & Iron Division of United States Steel Corporation** at Fairfield, Alabama, were announced by **Air Reduction Sales Company**. In addition, another plant for the production of gases of the atmosphere is being erected at the same location

to serve customers in the Southeast.

The new plants, which will have a production capacity of 145 tons per day of high purity industrial gases, will be installed and operated by Air Reduction. Tennessee Coal & Iron will use the oxygen in metallurgical applications in the manufacture of steel as well as for general steel mill purposes. It is anticipated that equipment and facilities will be installed and in operation within 18 months.

Plant Maintenance & Engineering Conference

Seventy-one speakers will address the 11th Plant Maintenance & Engineering Conference at Philadelphia in January. The conference, one of the best attended engineering meetings of the year, is held annually in conjunction with the Plant Maintenance & Engineering Show. Both events are produced by Clapp & Poliak, Inc., New York exposition management firm.

Both will take place at Convention Hall, Philadelphia. The show's dates are Jan. 25 to 28 and the conference, Jan. 25 to 27. Speakers, who will lead 43 discussion sessions, are drawn from 52 companies, in 20 basic industries, located in 19 states and three Canadian provinces.

Five acres of exhibit space will house the displays of more than 400 companies, with thousands of products and services demonstrated under simulated factory conditions. The twin events have taken place on the East coast only twice before — in 1952 and 1956, and attendance at the eleventh show is expected to break previous records.

Aside from the conference sessions where technical papers of broad general interest are presented, executives of ten major industries will gather at round tables to consider problems peculiar to their own plants. Chemicals; food-processing; foundries; metal-working and metal-fabricating; petroleum refineries; pulp and paper mills; research, development and pilot plants; rubber mills and rubber product plants; steel mills, and textile plants, will thus get special attention.

New Temco Radiation Laboratory — Texas

Recent progress in antenna design and development at Temco Electronics, a division of **Temco Aircraft Corporation**, Dallas, Tex., has made necessary the construction of a new Radiation Systems Laboratory, described as the most modern in the Southwest.

A. R. Teasdale, Jr., Manager of Temco Electronics, said that a radiation laboratory constructed two years ago on Temco's 500-acre tract at Garland is inadequate for the amount and scope of the division's projects.

The new building will contain 20,000 square feet of floor space and house approximately \$750,000 worth of equipment. Construction is to be

completed early in March of 1960.

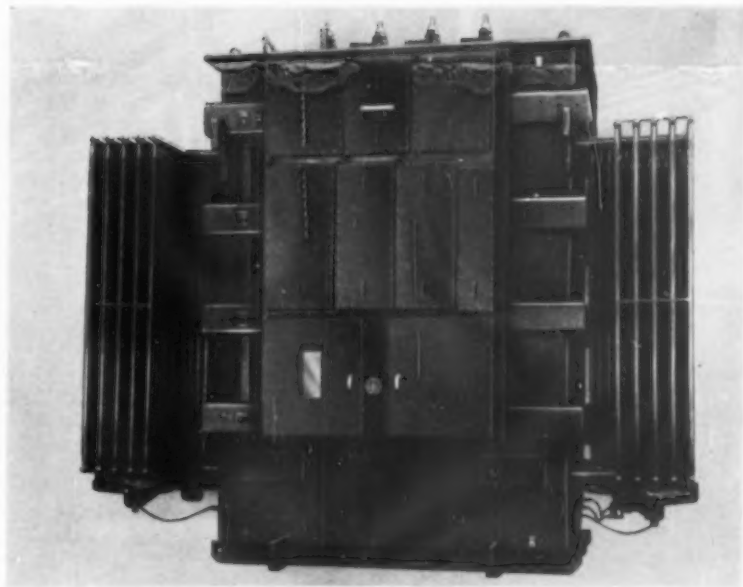
The new laboratory will include a model shop for construction of test models, a recording center for the compilation and evaluation of data, a design room, and ranges for the testing of a wide variety of antenna systems. These facilities will be used in the development and modification of radar and communication equipment, missile guidance systems, reconnaissance devices, and satellite antennas.

Va. Elect. & Power Co.

Olin R. Compton, Assistant Superintendent of Electrical Equipment of the Virginia Electric and Power Company, has been named Super-

former division in Sharon, Pa.

Westinghouse's search for better insulating and cooling mediums for transformers, especially those transformers used in areas where conventional oil-filled transformers would present a fire hazard, led to the consideration of fluorocarbon compounds. The fluorocarbon compound used is nontoxic, fire and explosion-proof, and totally inert. It has excellent cooling and insulating characteristics and together with SF-6 gas, operates very effectively at pressures low enough to permit use of conventional transformer tank design.



Gulf States Utilities Buys First Gas-Filled Load Tap Changer Unit

APPLICATION of the vapor/gas cooled transformer has been greatly extended by the recent shipment of the world's first unit with gas-insulated load tap changer (LTC) equipment. The voltage range of the vapor-cooled transformer was also increased from 34.5 kv to 67 kv.

This transformer rated 7500/9375 kva, 67 to 13.8 kv, three-phase, was shipped to Gulf States Utilities in Beaumont, Texas, from the Westinghouse Electric Corporation's trans-

former division in Sharon, Pa.

Mr. Compton, a native of Parsons, W. Va., was graduated from West Virginia University with a B.S. degree in electrical engineering. He joined Vepco at Richmond in 1949 as an engineering assistant. He later became a junior engineer, and served in this capacity at Richmond and Roanoke Rapids, N. C. In 1956, he was appointed Assistant Superintendent of Electrical Equipment.

Mr. Brown had been with the company for 33 years and served in various posts at Hampton, Charlottesville and Richmond. He is a native of Rockbridge, Va.

(Continued on Page 49)



INDUSTRY SPEAKS

Industrial Water

A CLOSE RELATIONSHIP between navies and water has always been evident. The use of water for steam for propulsion, then the preparation of drinking water from the sea, and now the production of breathing oxygen for crews in long-submergence submarines by distillation and electrolysis of sea water, have broadened and intensified the interest of navies in water.

These facts were underscored by Frank E. Clarke, industrial water expert, at the U. S. Naval Engineering Experiment Station, as he spoke at the Industrial Water Industry Luncheon on October 15 at the ASTM 3rd Pacific Area National Meeting in San Francisco.

Mr. Clarke's paper, "Old Wine in New Bottles — A New Look at the Substance Water," contained many new ideas about water which showed that this "commonplace" substance is destined eventually to become the most important of our resources.

With the aid of colored charts, Mr. Clarke presented the most modern concepts of the structure of the water molecule, starting with the probable structure of the basic components — hydrogen and oxygen atoms. Including possible combinations of ordinary hydrogen, deuterium, or tritium with oxygen isotopes having atomic weights of 8, 9, 10, or even 11, Mr. Clarke said that at least 18 different varieties of water molecules have been shown to exist, even without counting any of the compounds of the short-lived oxygen-19 (less than 1 min. half life).

A startling concept of the water molecule was presented on the basis of "evidence that each body of water, even the ocean, is a single gigantic molecule or lattice, which might be written $(H_2O)_n$."

Recent submarine explorations under the polar ice cap have disclosed the surprising fact that large amounts of fresh water are to be found in layers 10 to 12 feet thick under the ice. These layers presumably have resulted from the self-desalting of sea water by fractional crystallization and stratification. The separation between fresh water and sea water is so sharp that objects of proper specific gravity will sink through the fresh layer and stop abruptly at the surface of the salt water.

Striking differences between the different kinds of water were brought out. For example, heavy water (deuterium oxide) will not quench thirst, will not

support plant life, but is useful as a neutron moderator in fission reactions to slow up neutrons to the optimum velocity for production of fission effects.

New and potential uses of water were discussed. Now that submarines can remain under the sea for very long periods, the water itself is desalted and then electrolyzed to provide oxygen for breathing.

Ocean water is a storehouse of minerals, more and more of which will ultimately be found to be economically recoverable. The most striking prospective use of all was described as the possibility of separating from water the traces of deuterium and tritium and then combining them in a controlled fusion process that would result in the greatest potential energy supply to be found in any materials in or on the earth.

Water and Industrial Waste Water

Industry in general, and the West in particular, is increasingly concerned with adequate supplies of process and cooling water, and the further problem of disposing of the waste water. Ten papers covering these problems and offering some answers were heard at the Symposium on Handling and Utilization of Water and Industrial Waste Water.

Sample topics were: the determination of radioactive materials in water, the disposal of radioactive waste waters, and the disposal of oil field brines. The latter problem has been solved by using untreated oil field waste waters of relatively low salinity for irrigation of local crops, one paper discussed the effects of various types of industrial wastes on water for irrigation. The case for municipal treatment of industrial wastes, in addition to sewage, was also presented.

Subjects of other papers were: treatment of water for once-through reactor cooling electric membrane (electrodialysis) demineralization of a municipal water supply, and solar distillation of saline water. Particular consideration was given to problems with materials for use in solar stills.

Cooling towers were shown to be valuable in reducing the amount of water needed and in helping to reduce pollution by industrial wastes through keeping the wastes at the optimum temperature for most effective treatment, for instance, in activated sludge treatment of wastes from a paper products plant. Since excess temperature of waste water can be very objectionable, cooling by suitable towers can itself be an important treatment of waste water not requiring other treatment.



Who Discovers the Discoverers?

"A professor can never better distinguish himself in his work than by encouraging a clever pupil, for the true discoverers are among them, as comets amongst the stars." CARL LINNAEUS

Somewhere in this mighty land of ours, a gifted youth is learning to see the light of tomorrow. Somewhere, in a college classroom or laboratory, a dedicated teacher is gently leading genius toward goals of lofty attainment. Somewhere the mind of a future discoverer—in science, engineering, government, or the arts—is being trained to transcend the commonplace.

Our nation has been richly rewarded by the quality of thought nurtured in our colleges and universities. The caliber of learning generated there has been responsible in no small part for our American way of life. To our college teachers, the selfless men and women

who inspire our priceless human resources, we owe more than we will ever be able to repay.

Yet how are we actually treating these dedicated people? Today low salaries are not only driving gifted teachers into other fields, but are steadily reducing the number of qualified people who choose college teaching as a career. At the same time, classrooms are beginning to get overcrowded. In the face of this, college applications are expected to double by 1967.

This is a severe threat to our system of education, to our way of life, even to our very existence as a nation. Our colleges need help—and they need it now!



If you want to know more about what the college crisis means to you, and what you can do to help, write for a free booklet to: HIGHER EDUCATION, Box 36, Times Square Station, New York 36, New York.

Sponsored as a public service, in cooperation with the Council for Financial Aid to Education



TIMELY COMMENTS



You Pay for Plant Services

THE CALENDAR has very little to do with leaks and waste, but January is as good a time as any to get some of those things done that we have been putting off. And most of us need some sort of time table or time budget for the many non-emergency repairs that are stealing from plant economy here and there.

Power

Once a year, every industrial plant should make a thorough power check. A capable man in the plant organization can and should head up the check. But he may need considerable outside help — and he certainly will need the cooperation of his co-workers.

When the check is completed the checker should be able to answer all questions on electric power — both general and specific.

First of all, he should know all about the way his purchased power rate operates — and he should know about other available rate schedules that might be more advantageous.

If the plant generates its own power — need for checking is still more important. Home-made power is expensive too — and it can be a real money hog if not properly handled.

Some of the things in plant operation that run up the power bill are:

- 1—Motors that are too big for the job.
- 2—Belts and bearings that are not performing properly.
- 3—Low power factor that causes excessive demand charge.
- 4—Equipment left running, when it should be shut down.
- 5—Wrong lubricants that add to both the kva demand charge, and the kwh energy cost.

If the job gets too big for the plant organization — there are power consultants that can be employed. And in any event the utility company's power specialist should be consulted.

Almost certainly such a thorough check will turn up things that need correcting — overloaded circuits, non-functioning meters and controls, etc.

Steam

The plant engineer is likely to be more familiar with his steam than with power. But even so, he neglects steam also: too many leaks, insulation damaged or inadequate, using (expensive) high temperature steam where a lower heat value is adequate, failure to recover condensate, and failure to recover heat value of waste water by use of heat exchangers.

A more difficult study in big plants is the entire steam plant and utilization cycle. In many cases somewhat elaborate and expensive replacements and improvements are indicated for economy's sake. Normally such big and elaborate changes are best directed by a power plant specialist. But just stopping leaks and replacing insulation can make a big improvement in many plants.

Water

Water is not cheap. Even if you have your own wells or your own lake — the cost of pumping and treating is appreciable.

First stop the leaks. Then see if you are using clean (expensive) water where the waste from another process might serve. And conversely make sure that no water is dumped to the sewer until it has served every economical service. Frequently, contaminated water can be cleaned up and used again.

How about your water pressure at various points of utilization? Too low pressure slows up operations and is a nuisance. Too high pressure raises your power bill for pumping, and in some cases causes excessive maintenance.

General

And when the big three (power, steam and water) have been studied individually, take a look at the entire picture. The three elements are closely related, and at least to some extent each affects the other. This is particularly true in a processing plant where steam is used at several pressures and temperatures, and power is generated locally. Heat balance in such a plant is a big problem and requires real study by an expert to get the right answer.



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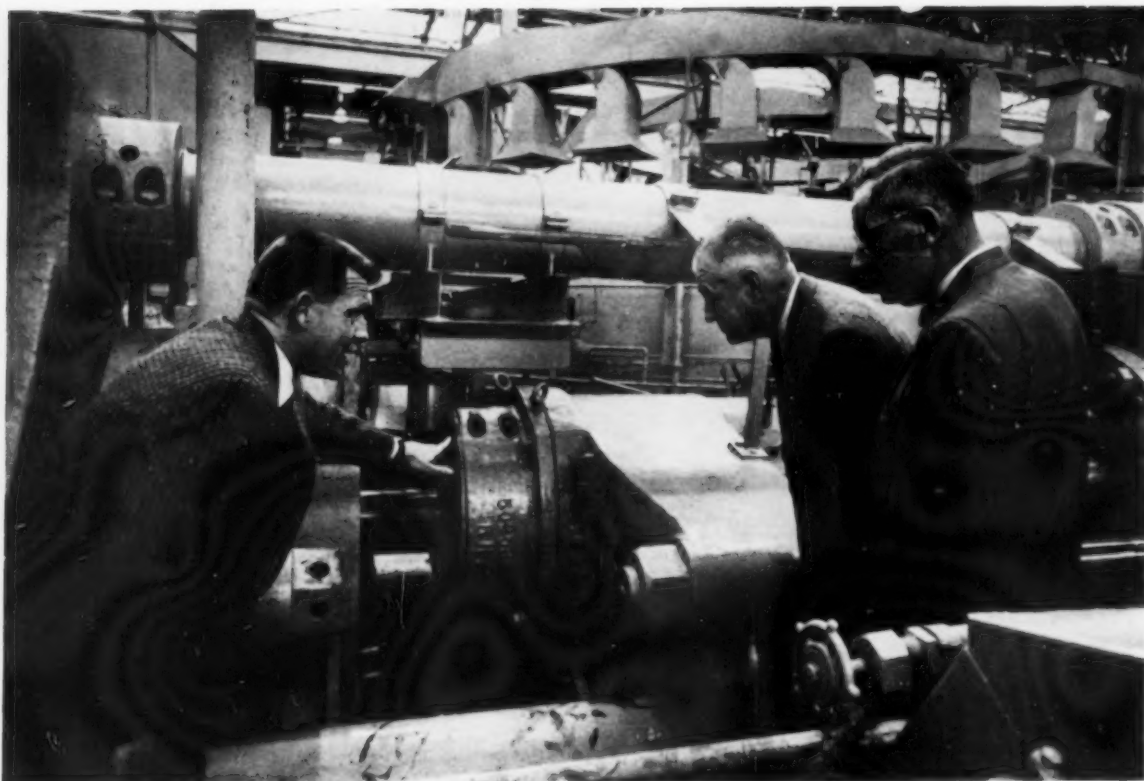
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Plant engineer, plant manager, and production superintendent study extrusion press. The plant engineer is in charge of maintenance and his section is on the same level as those engaged in production.

Teamwork Pays

PLANT MANAGEMENT too often considers maintenance only as a necessary overhead cost — a problem that unfortunately exists. Consequently, this important plant function is treated as a stepchild and considered far less important than production.

This is not the approach at Wolverine's Decatur plant. We feel that maintenance goes part and parcel with, and is of equal importance to, production. At Decatur, the term "maintenance" always has the connotation of "maintenance engineering" or "plant engineering," and is the responsibility of the 151 men who make up the engineering section. The plant engineer, who heads this broad gage function, is on the

By P. W. ROBSON
Plant Manager
Wolverine Tube Division
Calumet & Hecla Inc.
Decatur, Alabama

same level as production section heads; he, too, reports directly to the factory manager.

The plant engineer's section has major responsibility in the areas of design, construction, maintenance, and inventory control of maintenance material. He also has some responsibility, working with section heads in the areas of purchasing and industrial engineering. To meet these responsibilities the plant engineering section is staffed with personnel that have engi-

neering degrees plus specialized knowledge in areas such as drafting, tool and facility design, and materials of construction.

Construction and Design

Where construction is major, the plant engineer's group is responsible for working with the contractor to insure that all the required specifications are met. Where minor building or utility construction is necessary the section handles it completely. This section also builds special production equipment, as for example, a direct casting unit for casting aluminum billets.

Major construction operations are the specific responsibility of the chief planning engineer who

is directly below the plant engineer. The chief project engineer is responsible for design and drafting work and personnel reporting to him consists mostly of graduate engineers. Besides being responsible for design work on minor construction jobs, this group also designs new machines, tools, jigs and fixtures.

The following is an example of how closely maintenance, design, and production are tied together. An engineer noticed that a specific piece of equipment was constantly in need of repair. Indications were that it was not designed for the work it was doing. As a result he designed and installed a higher capacity piece of equipment to perform the same function. As a result there have been no subsequent breakdowns of this equipment.

Evaluation of Purchases

The Engineering Section keeps complete records on every piece of equipment that the company has purchased. The records fall mainly into two categories — identification and maintenance. The identi-

**Here's how
engineering, operating
and maintenance heads
work together at
Wolverine's Alabama Plant**

fication records list such details as item number, make, capacity, plant location and price. The maintenance records list all maintenance work performed, the amount of time the equipment was out of operation and the exact reason for the downtime. Evaluation of these maintenance records gives an accurate picture of the reliability of specific manufacturers' equipment, and the records are an ideal guide in deciding between competitive equipment.

The records are also of great value to management. They present a true analysis of operational expenses and are a good basis for

judging what the cost would be to operate a new facility in case of expansion.

Utilities Research

The Plant Engineering Section is responsible for keeping records on the plant's utility consumption. Analysis of these records made it possible for Wolverine to cut down on both the cost of gas and electric power.

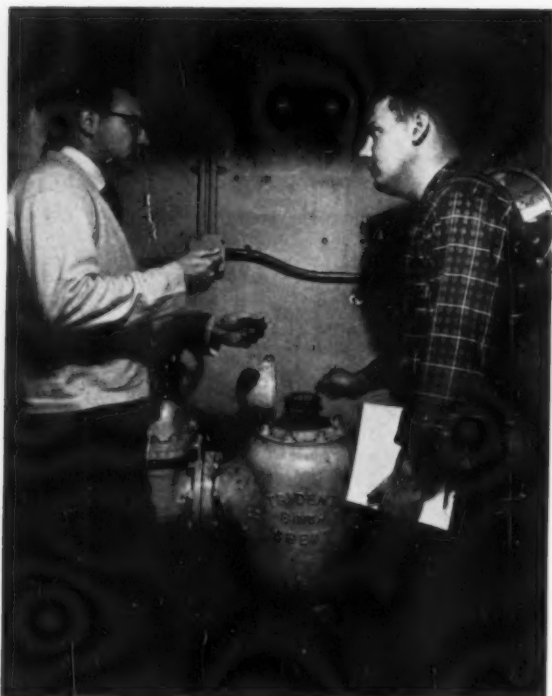
The company pays a surcharge on electric power based on peak demand. The charge for a month

is the result of the maximum consumption of power for any thirty minute period. Analysis showed the peak was always being reached at the same period — right after the evening meal when the workers were all starting their equipment up again simultaneously. It was found cheaper to keep the large equipment in operation during this period because of the lower demand price that resulted.

A very close parallel existed with gas consumption. Here the demand charge is based on con-



The plant engineer's section is also concerned with special projects. Chief planning engineer (right) is studying a design to lessen the amount of copper in plant effluent.



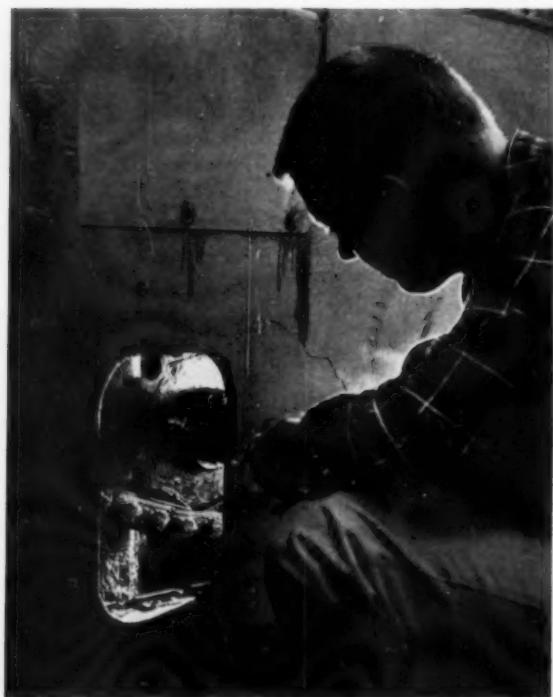
Chief planning engineer (left) and maintenance engineer discuss water consumption. Wolverine is developing a recirculating system for process water.



Maintenance engineer checks chain drive during a scheduled inspection. Plant engineer's section and production section work to schedule inspections.

The plant engineer's section often designs equipment. The chief project engineer checks to see that shop is following specifications on design.

Maintenance engineer inspects press. Before major inspections, he gets together with members of production department to discuss "trouble areas."



sumption for a 24 hour period but in this case the resultant charge lasts for a whole year. A study by the plant engineer's section showed that the company could lower the demand charges and cut costs by using propane (we still have a complete propane plant which was used before the switch-over to natural gas) at peak periods rather than purchased natural gas. This is true even taking into consideration the higher cost of propane.

Inventory Control

The Plant Engineering Section's recommendations are a key factor in maintenance material inventory selection. By studying maintenance records they can easily forecast what parts should be stockpiled. They also know what parts are "vital" and must be available at all times to avoid a major slowdown in production.

Scheduling Inspections

Inspection and servicing of major pieces of equipment are one operation at Decatur. The maintenance inspectors confer with members of production to select an inspection time when the least interruption of production will occur. This is usually on a weekend or a holiday.

Production personnel inform the inspectors in advance where definite trouble areas have been spotted. They also inform them if they know about any parts that are so worn that replacement is necessary. This way the inspectors have time to order parts and have them available at the time of inspection.

Training Programs

The Plant Engineering Section carries on a fire control program. Personnel meet once a month and are taught the operation, placement and maintenance of fire equipment and the procedures that are to go into effect in case of fire.

Training programs are also provided for personnel in the skilled trade groups. Under this plan, groups meet to learn the fundamentals of machine shop practice, blueprint reading, electrical maintenance, etc.

The maintenance group is often called upon to handle special



One of plant engineer's section's responsibilities is keeping records of utility consumption. Careful study of the use of electric power has made it possible for the company to cut peak demand for which there is a special surcharge.

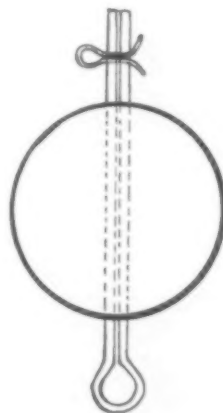
projects. One project that they are working on at this time is a method to lessen the amount of copper remaining in plant effluent. Another is the development of a re-

circulating system for process water. This promises to solve a present water consumption problem and cut water costs.

Cotter in Cotter

WHERE LARGE cotter keys require frequent insertion and removal, with consequent shortening of their useful safety and life, drill the ends of their legs and install a smaller cotter to keep the larger one positioned.

By H. J. MILLER, Fla.



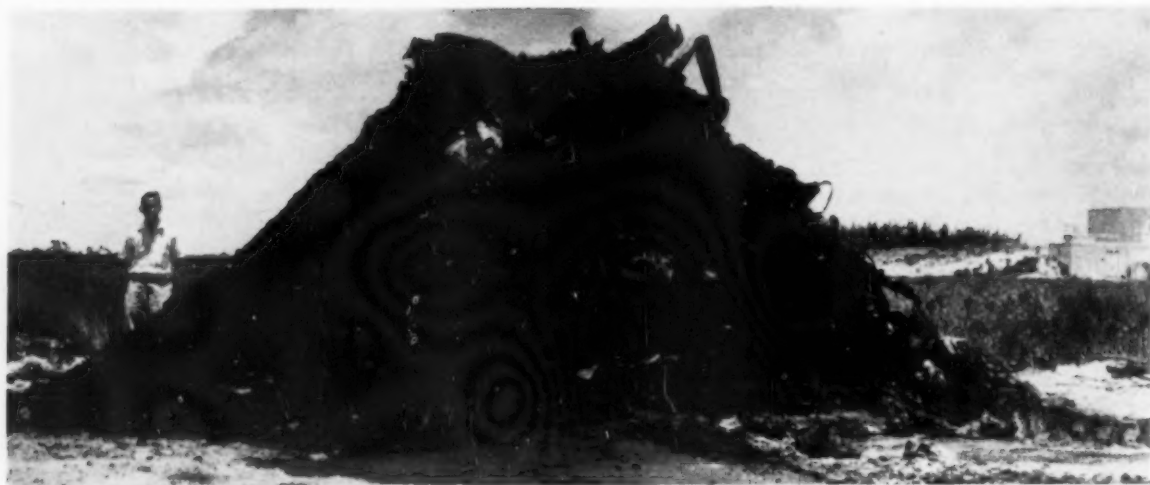


Fig. 1. About 200,000 pounds of deposits was removed from a 550,000 pound per hour boiler after 6 months operation, using dolomite as a fuel additive.

Florida Engineer Tells How Slag Deposits and Corrosion Are Reduced

Slurry Coatings for Heating Surfaces

THIS IS AN ABSTRACT of Mr. Keck's paper presented at the Engineering and Operating Section Conference of Southeastern Electric Exchange Oct. 15 in Atlanta.

By J. W. KECK
 Superintendent of Power Plants
 Florida Power & Light Company
 Miami, Florida

THE PAPER DESCRIBES experiences in plants of Florida Power & Light Company in processing boilers fired with residual fuel oil to make the fireside surfaces resistant to slag deposits and corrosion. A resume of procedures and equipment employed for coating fireside surfaces is included. Diamond Power Specialty Corporation extended valuable assistance in adapting soot blowing equipment to handle the slurry and spray it on the surfaces.

BOILERS burning residual fuel oil and operating at steam temperatures below 800 F are subject to slag deposits on furnace, superheater, generating and economizer tubes. But the deposits are generally porous and soft. Therefore this article is confined to discussion of problems and procedures in higher temperature operations where conditions are severe.

Boilers operating at steam temperatures above 800 F and press-

ures above 800 psig are subject to heavy slag deposits on furnace, superheater, reheater, and economizer tubes, and on the furnace floors. The deposits on the tubes of the furnaces and on the primary sections of the superheaters and reheaters are dense, hard and tightly bonded to the tube surfaces.

The deposits on furnace tubes grow to a maximum thickness of approximately half an inch. Then additional deposits do not solidify,

but immediately start to flow down the tubes and finally collect on the bottom of the furnaces where they form molten masses.

Deposits in the secondary sections of the superheaters and reheaters grow somewhat thicker than on the furnace tubes, and as deposits become viscous, they move with the gas stream toward the adjacent loops until the loops are bridged.

Deposits on the economizer tubes are granular, porous and soft. Deposits in the air preheaters are composed of soot, dust and hard grains of slag.

High temperature corrosion occurs on all metal surfaces in the furnace and in the gas passages exposed to temperatures above 400 F. Tube surfaces are mildly at-

tacked, but unprotected and uncooled damper assemblies, hangers, spacers and supports are subject to metal wastage at extremely high rates. Low temperature corrosion is usually limited to air preheaters, dust collectors and their connecting ducts.

Figure 2 shows the slag accumulation on the primary superheater section of a 550,000 pound per hour capacity boiler operating with 1005 F total steam and reheat temperature during six months of operation.

Cleaning Methods Tried

Our experience in cleaning the fireside surfaces of boilers operating at higher steam pressures and temperatures by standard methods prompted us to try to develop a less expensive and more effective method.

Our first attempt was cleaning boilers in service by lancing of deposits, using boiler drum water as the lancing fluid. Then, recognizing the deficiencies of boiler cleaning with lances, we concentrated our investigations on fuel oil additives. Among the additives used were dolomite, high magnesium lime, magnesium oxide, calcium oxide and two batches of secret formula materials.

The results obtained from dolomite and from high magnesium lime were practically identical. The volume of the deposits on the tubes was reduced slightly and some minor changes occurred in the physical characteristics of the deposits. However, after experimenting for more than a year we were convinced that the advantages were more than offset by the disadvantages.

Figure 1 shows a portion of the approximately 200,000 pounds of deposits removed from the furnace and passes of a 550,000 pound per hour capacity boiler which had been in service for six months using dolomite as a fuel oil additive.

Tests using magnesium oxide injected with the fuel oil reduced the volume of the slag in the high temperature zones slightly, and also reduced the tensile strength of the slag to a limited extent, making removal easier. But the improvement was not worth the cost. Lime in the form of either

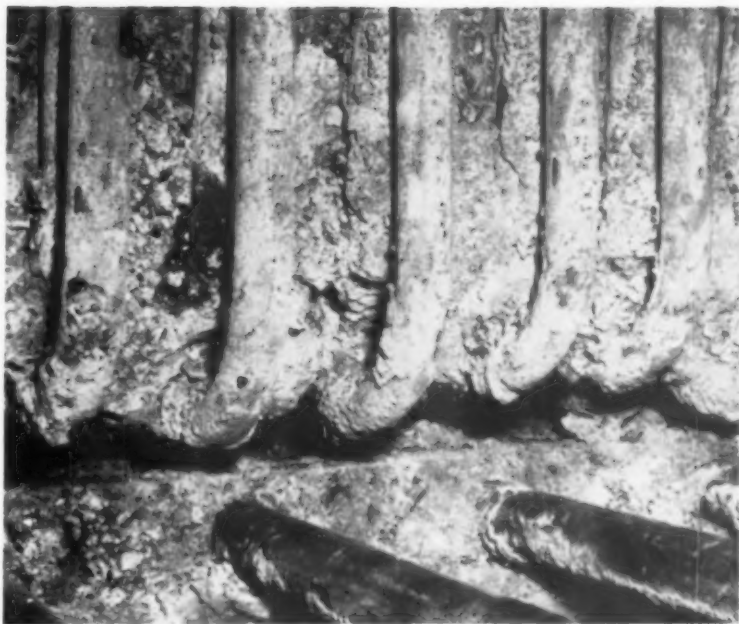


Fig. 2. Slag accumulation on primary superheater section of 550,000 pound per hour boiler, 1005 F, after 6 months operation.

calcium oxide or calcium hydrate injected dry did not produce any significant change in quantity or characteristics of the slag deposits.

One batch of secret formula additive, which plant operators identified as "Black Magic" was mixed with the fuel oil in the service tank. Although it did a good job of cleaning the fuel oil heaters and slightly reduced the viscosity of the fuel oil, it did not change the rate of formation of slag deposits.

The second batch of secret formula additive was promptly named "Black Magic No. 2." This material was injected immediately above the fuel oil burners as directed by the manufacturer. All slag deposits disappeared from the water wall tube surfaces within a week. But during the second week, a resistance developed in the primary section of the superheater bank which reduced the boiler capacity to 75 per cent of design rating.

An inspection of the unit revealed flint-like deposits on the primary section of the superheater and hot end of the economizer, in sufficient volume to obstruct 75 per cent of the gas flow area.

Coating Process

On the basis of our experience with additives, we decided to try some other approach to our problem.

Consideration was given to two phenomena which we had previously observed:

1. Air preheater elements, after being washed with an alkaline solution, are immune to deposits, while those washed with plain water begin to foul immediately.

2. Fireside surfaces of boiler tubes rinsed with an alkaline solution and coated with a slurry of lime during outages, are immune to deposits for a period of time after being returned to service.

Based on these phenomena, we felt that the period of immunity to slag deposits could be extended provided we could periodically apply a coating of calcium oxide to the surfaces while boilers are in operation.

Our initial investigations of a process to apply calcium oxide indicated that a fine mist-like spray of slurry composed of water and calcium oxide readily adhered to clean hot tubes and to hot slag deposits. We, therefore, conducted tests on two boilers, one of which

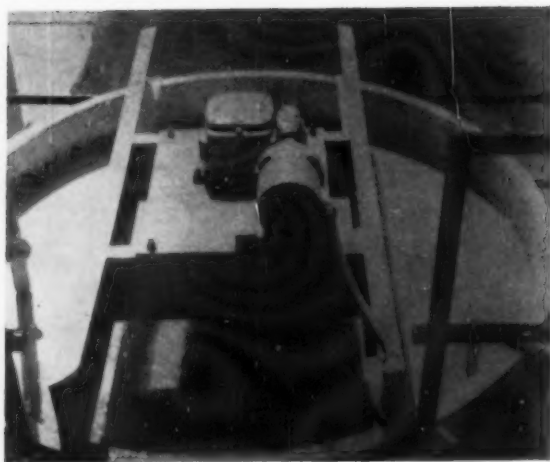


Fig. 3. Slurry storage and agitator.

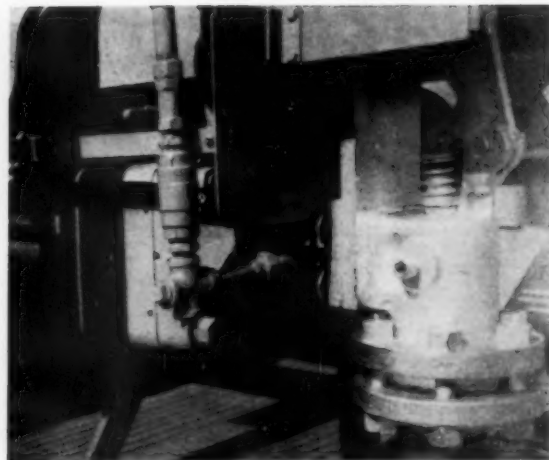


Fig. 4. Slurry piping to soot blower.

was free of deposits and the other heavily loaded with deposits.

The tests showed conclusively that the metal surfaces which had been sprayed with calcium oxide slurry did resist the adherence of slag as long as the coating was present.

The tests also showed that the calcium oxide sprays applied to slag deposits caused a surface layer of slag to separate and dislodge from the main body of slag, and repeated spraying caused additional layers to dislodge.

Having determined that the lime sprays were more effective in removing deposits than lancing, we discontinued lancing and adopted slurry spraying on sixteen high pressure, high temperature boilers.

Our experiences over a period of a year with manual application of slurry sprays justified the following conclusions:

1. Boiler surfaces spray-coated while in service with a slurry consisting of calcium oxide and/or magnesium oxide and water resist the adherence of slag deposits for a period of several hours.

2. The slurry sprayed on incandescent or viscous slag deposits develops a crust which dislodges in a period of hours from the main body of slag or from the boiler surfaces.

3. Slag crusts produced by calcium oxide slurry sprays are dense and brittle, while those produced by magnesium oxide slurry sprays are porous and granular.

4. Slag accumulations on furnace floors of boilers which have been processed on a daily schedule with calcium oxide and/or magnesium oxide sprays are in the form of pebbles that do not fuse together.

5. Deposits in the primary sections of superheaters and in economizers which have been processed on a daily schedule with slurry sprays are in the form of coarse grains which have little cohesive or adhesive characteristics.

6. Two or three thin coats of slurry sprays with three or more hours between coats are more effective than one thick coat.

7. Slag deposits which have been coated repeatedly with slurry sprays are slightly soluble in water.

8. Daily spraying of boiler furnaces and gas passages with slurries of calcium oxide and/or magnesium oxide effectively reduces stack emissions.

9. Spraying of boiler surfaces with slurries does not affect the rates of fouling of air preheaters and dust collectors.

10. Power driven equipment preferably automatically controlled is required to obtain complete and uniform distribution of spray materials, minimize the hazard of thermal shock and minimize labor costs.

Development of Equipment

In the development of equipment to make the application of slurry sprays a power driven automatic process, various designs were considered. However, it was obvious that it would be highly desirable to use standard soot blower installations if suitable conversions of equipment could be developed.

Experiments with soot blower systems indicated they could be made to deliver the slurry in finely divided droplets in a pattern which would provide excellent distribution by utilizing a mixing device in the lance with steam as the injecting medium.

The completely automatic system developed includes provisions for storing, agitating, pumping and delivering of slurry to the soot blower units and for purging the slurry piping after operation. It also includes the soot blower units converted for spraying the slurry, the control panel converted for control of the complete slurry process, and the steam pressure regulating valve to provide the appropriate steam pressure for slurry injection.

Figures 3 and 4 show slurry agitator and connection to soot blower unit which serves a 1,100,000 pound per hour capacity boiler with operating steam pressure of 1800 psig and total steam and reheat temperature of 1005 F.

Conclusion

The soot blower installations of forty of our boilers in nine principal power plants have now been converted to apply slurry sprays to all boiler surfaces exposed to the products of combustion. Thirteen of these installations are arranged for completely automatic operation and twenty-seven are arranged for semi-automatic operation.

Our standard slurry spray schedule provides for one application per day for furnace, superheater, and reheater tubes and one application per week for economizer tubes.

Boilers with surfaces processed at appropriate intervals with slurry sprays remain sufficiently

free of deposits to permit continuous operation at approximately manufacturers guaranteed performance from one annual boiler outage to the next without lancing or intervening outages for boiler cleaning.

Today the cleaning job during outages is a minor detail that generally can be performed by one man within twelve hours after the boiler has been removed from service. The comparatively small quantity of deposits adhering to the boiler surfaces is removed by washing with water injected through the soot blower lance at a nozzle pressure of approximately 50 psig.

The washing job is started when the boiler pressure reaches approximately 300 psig. With the soot blower steam supply valve closed, the orifice restrictions removed, and the forced and induced draft fans operating at maximum capacity, the soot blower units, one at a time, are operated through normal travel cycles. One plant operator follows the washing operation and manually starts selected units in service as required for efficient removal of deposits.

Recent experience indicates that all adhering deposits can be removed before the steam pressure is reduced to atmospheric. The remaining cleaning operations are begun as soon as the boiler reaches a temperature which permits men to enter the furnace. The only additional cleaning usually required is to shovel the accumulated deposits into chutes for discharge into a collecting vat.

Examinations and measurements of furnace, superheater, reheater and economizer tubes during successive boiler outages indicate conclusively that wastage of tube metal resulting from high temperature corrosion is effectively reduced. However, superheater and reheater hangers and other boiler parts located in the high temperature zones which are not water cooled, do not receive the degree of protection from slurry sprays that is required to prevent excessive deterioration.

Tests of air preheaters during the past year show that washing of elements with alkaline solution has little or no effect on the

rate of element wastage from low temperature corrosion. These tests also showed conclusively that preheater metal and gas temperatures largely, if not entirely, control the rate of low temperature corrosion of preheater elements.

A series of tests were made to

Lightweight Insulation

A NEW LIGHTWEIGHT, acid and heat resistant foamed silica material has solved a design problem in Petro-Chem Development Company's widely used "Iso-Flow" furnaces. It enabled the Houston, Tex., company to save on material costs and labor. In addition, it is anticipated that longer service life is assured the users of the equipment.

These furnaces range in size up to units over 150 ft high that cost about \$200,000. When used in an oil refinery, for example, crude oil passes through the furnace before feeding into the fractionating towers. It is heated in tubes that pass through the furnace.

The furnace is cylindrical and a baffle is hung at the top of the cylinder to retain the heat. This is where the problem arose.

Former baffles were of insulated alloy steel and they did not last too long. Bottom temperatures

determine the effect slurry spray coatings have on acid dew point of flue gases. These tests indicate that the dew point is reduced approximately 30 F when the spray schedule is maintained on a daily basis, and there is possibility of additional reduction.

range as high as 2000 F. By the time heat and gases reach the top, they may still be as high as 1300 F. Sulphur and vanadium present in the fuel oil when burned at such temperatures produce Vanadium Pentoxide, which was highly destructive to the steel baffle. The foamed silica material now used is known as Foamsil and is a product of the Pittsburgh Corning Corporation. Being 99% pure fused silica it is unaffected by most corrosive chemicals. In addition, temperatures can cycle from -450 F to 1600 F without any harm to the material.

According to Mr. John W. Throckmorton, vice-president and general manager of Petro-Chem, other materials were considered before the final choice was made. Among these was firebrick. However, the cost of firebrick was higher. More important, it would require considerable support. Foamsil weighs only 12 lb per cu ft, yet has a compressive strength of 200 psi, and is available in large sizes.

Foamed silica blocks are slid along alloy steel channels to make the baffle. The material is unaffected by the heat and corrosive products that caused continued replacement of former materials. Its light weight and easy workability led to material and labor savings.



MAINTENANCE PROGRAM For The ELECTRICAL DEPARTMENT

A GOOD WELL rounded maintenance program requires first a thorough analysis of equipment and conditions in your particular plant. What will work well in one plant will not be adequate in another.

Delay Value

First you must look at your plant in the overall and separate into the category in which it belongs: departments that are in continuous production where any delay in down time is costly, and other departments where some down time can be allowed without being too costly.

Next some measuring stick must be found to gauge your down time so as to correctly evaluate the delays. In our system, in the continuous production departments we use a system of actual hours and machine hours. For instance there are 12 machines, so we have 12 machine hours per hour. Then, one machine down 1 hour = 5 minutes actual down time; 6 machines down 1 hour = 30 minutes actual down time in this Unit.

All supporting units are set up this same way, cranes, sand machinery, etc. We now have a measuring stick that tells us how bad any delay would be, and where we need to do our best maintenance work.

Record System

Next you will need a good record system that will tell you which pieces of equipment fail and which will stand up under heavy production demands. We use a Post Index record system (color coded cards by departments) for this type record. Each card carries the life

By K. L. DILLON
Chief Electrician
American Cast Iron Pipe Company
Birmingham, Alabama

history of this motor or piece of equipment since its purchase. This information of failures is also punched into IBM cards so a total of all performance can be had at any time.

This will pinpoint your trouble spots so proper recommendations can be made to management and to the engineering department.

Service Organization

Now you must plan your service organization to cover the conditions in your particular plant. In our plant we have operations that cover 24 hours, some 16 hours, some 8 hours. So our shifts must be planned to cover this.

We have one foreman and six trouble men on each shift who make the service calls and do minor repairs on the job. Some of these people are stationed right in the plant they serve. The rest work from the central maintenance department. Many of their calls are by phone.

Shop Organization

Last but not least you should have a shop organization that can quickly change out and repair any piece of equipment that fails suddenly. Also necessary is an adequate stores facility with spare parts to do the job.

Preventive Maintenance

A close study then of your annual delays will tell you exactly where you stand. Now you can

intelligently plan your preventive maintenance program. Regularly scheduling vital equipment out for inspection and change out will hold your delays to an absolute minimum.

The preventive maintenance program in our plant was set up on these lines and has worked out very well. Our present number of employees is 2,200 and our average kilowatt hours per month is 3,194,833. We have 2,782 motors in service amounting to 43,287 horsepower. In 1958 we used 607,181 pieces of material from our stock supplies at a cost of \$307,500.00. We answered 9,140 telephone trouble calls. 516 motors were rewound or repaired in 1958. These statistics are only given to let you gauge the size of our operation.

We have in our Electrical Maintenance Department 47 employees, 45 white and 2 colored. We feel that we have one of the most efficient operations of this kind in the country today. I will supply more detailed information on request.

**KEEP UP-TO-DATE
USE SPI
READER SERVICE**

See Page 67

DEIONIZERS

ION EXCHANGERS

DEALKALIZERS

WATER SOFTENERS

WATER TREATMENT



DEAERATING HEATERS

AERATORS

FILTERS and PURIFIERS

WATER TREATING CHEMICALS

Water Treatment



Reference Guide and Buyer's Directory for the South-Southwest

701—Algae Inhibitor — Algicide bulletin describes simple, effective and economical way to get rid of algae troubles in humidifiers, air washers, condensers, heat exchangers, and other systems where water is exposed to atmospheric contamination. — THE NORTH AMERICAN MOGUL PRODUCTS CO.

702—Equipment Guide — Bulletin 615 illustrates and describes newest manual and automatic zeolite water softeners, demineralizers and deionizers, dealkalizers, and includes spray and tray type deaerating heaters and water treating chemicals. — ELGIN SOFTENER CORPORATION.

703—Amine Treatment — Bulletin CP-100 shows how amine treatment is an easy, effective way to eliminate return line pipe corrosion which is often a critical problem in maintaining economical, efficient power plant operation. — THE BIRD ARCHER COMPANY.

704—8-Point Treatment — 4-page brochure points out company's 8-point water treatment coverage for elimination of scale, sludge, corrosion, and impure steam. — IPCO LABORATORIES, INC.

705—Condensate Return Lines — Bulletin tells you how to update return line protection with Super Filmeen — a new flaked, free flowing product readily dispersible. Shipped as 100% active ingredients. — DEARBORN CHEMICAL COMPANY.

706—Scale Remover — Bulletin shows how Anco Scale Remover quickly eliminates scale in boilers, water lines, refrigeration and air conditioning systems. — ANDERSON CHEMICAL COMPANY.

707—Water Conditioning Services — Brochure describes company's engineering services — zeolite water softeners, filters and purifiers; exchangers, aerators and degasitors; and process and boiler water conditioning. Rebuilding and modernizing service. — SOUTHERN WATER CONDITIONING INC.

708—Industrial Water — "Your Most Important Raw Material" describes consulting services on procurement, treatment and disposal of industrial water, including design of treatment and disposal plants. Emphasis on power, steel and industrial boiler water conditioning. — HALL LABORATORIES.

709—Air Conditioning Water Systems — Bulletin No. FAC-1 discusses corrosion and scale control for air conditioning water systems and describes equipment for various applications. — THE PEROLIN COMPANY, INC.

710—Demineralizer Catalog — Bulletin WC-111A, 30 pages, discusses demineralization of boiler feedwater and tells how demineralization produces pure water by ion exchange, thereby improving products and processes and reducing costs. Types of equipment are illustrated. — GRAVER WATER CONDITIONING CO.

711—Deaeration: Why? How? — Bulletin 4650 explains in capsule form fundamentals of deaeration and why it is so necessary in water conditioning. Principles, advantages, and application of various methods are discussed. — COCHRANE CORPORATION.

712—Hydrazine — Bulletin BW 8, 10 pages — Discusses chemical reduction of oxygen in boiler feedwater with Deoxy-Sol, a 35% aqueous solution of hydrazine. Gives flow diagram; covers handling and storage; includes bibliography. — FAIRMOUNT CHEMICAL CO., INC.

713—Brinemaking — 12-page bulletin explains "Efficient Use of Rock Salt in Brinemaking," and tells how to get a saturated brine at the lowest possible cost. Brinemakers are illustrated. — MORTON SALT COMPANY.

714—Akon Treatment — Bulletin 28B7408 illustrates and describes how Akon feedwater treatment controls boiler sludges where dispersive agents fail or lose their original effectiveness. — ALLIS-CHALMERS.

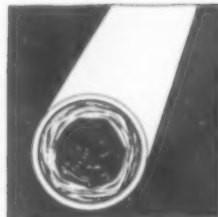
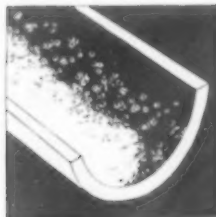
715—Condensate System Corrosion — Bulletin B6, 4 pages, "Corrosion Control in Steam-Condensate Systems," describes causes of condensate system corrosion, types and systems of inhibitors. — NALCO CHEMICAL.

716—Automatic De-Ionizers — Bulletin No. E-259 covers automatic control systems for ion-exchange

CATALOGS AND BULLETINS

Reference literature available from manufacturers to help solve water treatment problems and apply materials and equipment.

Use Reader Service Card on Page 67



equipment, with descriptive text and photographs. — ILLINOIS WATER TREATMENT COMPANY.

717—Steam Line Corrosion — Bulletin PSLT-1 explains how Perolin steam line treatment has all of the essential requirements for correcting the destructive action of acid steam and condensate simply and economically. — THE PEROLIN COMPANY, INC.

718—Two-Bed Ion-Exchange Demineralizers — Bulletin No. 200, 4 pages, explains principle of demineralization, advantages, construction, installation and operation, capacity, for many processing applications. — INDUSTRIAL FILTER & PUMP MFG. CO.

719—Proportioning Pumps — Illustrated bulletin describes proportioning pumps and package chemical feeding units designed for controlled capacity, low cost, and high pressure. — THE BIRD ARCHER COMPANY.

720—Cation Exchange — 24-page bulletin, "If You Use Water . . ." gives up-to-date information on use of Amberlite ion exchange resins to solve plant water conditioning problems. — ROHM & HAAS CO.

721—Mixed-Bed Deionizers — Bulletin 512A and accompanying data sheet describe mixed-bed deionizers which remove ionizable impurities as well as carbon dioxide and silica from water. — ELGIN SOFTENER CORPORATION.

722—Plastic Flow Tubes — Bulletin 115-20-1, 4 pages, contains descriptive text, dimension drawings and tables, cutaway view of design features, chart of comparative pumping costs, graphs, list of construction combinations available. — B-I-F INDUSTRIES, INC.

723—Ion Exchangers — Bulletin 1960-C, 16 pages, explains principles of ion and cation exchange, hydrogen exchange, anion exchange. Illustrated with specific plant applications. — INFILCO INCORPORATED.

724—Industrial Wastes — 8-page booklet shows diagrams of typical waste treatment systems, describes precipitator and separator, filters, evaporators, and related equipment for treating industrial wastes. — PFAUDLER PERMUTIT, INC.

725—Cooling Water — 4-page booklet, "The Chemical Treatment of Industrial Cooling Water," offers solution to cooling water problems designed to increase operating efficiency and decrease operating costs. — WESTERN CHEMICAL COMPANY.

726—Conditioning Equipment — Bulletin 200-7-52-10M, 8 pages, tells about deaerators, hot process softeners, reactors, filters, zeolite softeners, aerators and degasifiers, and other equipment for water conditioning. — AMERICAN WATER SOFTENING COMPANY.

727—Complete Boiler Water Conditioning — 12-page booklet explains 3-fold program including survey, treatment, and control, offered to Drew clients for their plants. Illustrated with photographs. — E. F. DREW & COMPANY, INC.

728 — Demineralizers — Bulletin 108-A, 8 pages, tells how industry's needs for chemically free water are met by quality controlled demineralizers. Explains theory, applications, and describes equipment. — L * A WATER CONDITIONING, INC.

729—Hydrazine in Feedwater Treatment — Folder explains why you need Scav-Ox (35% hydrazine solution) in boiler feedwater treatment. Lists physical constants, advantages, availability. Gives diagram of application of hydrazine solution to pump suction by gravity feed. — WATER SERVICES, INC.

730—Phosphates — Bulletin HSP-906, 4 pages, describes Hagan Phosphates for boiler water conditioning to prevent calcium scale, and Burosil to control both calcium scale and undesirable magnesium deposits. Includes case histories. — HAGAN CHEMICALS & CONTROLS, INC.

731—Deaerating Heaters — Bulletin WC-106A, 12 pages, discusses deaeration as an important safeguard to boilers, explains principles, and tells how the Graver tray heater operates. Standard designs are illustrated. — GRAVER WATER CONDITIONING CO.

732—Demineralizing Handbook — Bulletin 5800, 40 pages, compares various methods of water treatment, including evaporators, with demineralizers. Lists characteristics of various types of cation and anion exchange materials. Includes technical data, recommends types of units to meet varying conditions. Photographs and flow diagrams. — COCHRANE CORPORATION.

733—Steam-Water Cycle — Five basic requirements for trouble-free water conditioning covered in water treatment consulting service bulletin. — DEARBORN CHEMICAL COMPANY.

734—Sewage Treatment — Technical Paper No. 138, 16 pages, covers "Problems in the Use of Sewage Plant Effluent for Boiler and Cooling Purposes," and the treatment necessary for this method to be satisfactory and economical. — BETZ LABORATORIES, INC.

735—Valves for Filtration Plants — Bulletin W-18, 8 pages, describes filter drain valves, backwash valves, and rewash valves, specifically designed for use in filtration plants to fill the need for valves that can readily respond to repeated operation. — GOLDEN - ANDERSON VALVE SPECIALTY COMPANY.

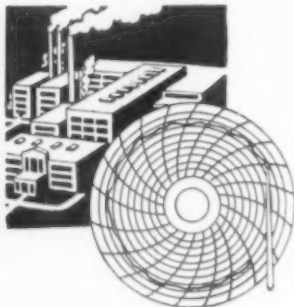
736—Purification Equipment — General catalog, in loose-leaf form, includes 24 pages on Inversand Zeolite Water Softeners; 24 pages on Boiler Feedwater Treatment; and



Industrial Water Treatment Reference Guide for the South-Southwest . . .

sections on Coagulator, Demineralizing Units, Pressure Type Water Filters, and related equipment. — HUNGERFORD & TERRY, INC.

737—Water Treating Plan — Separate bulletins combine in folder to form "A Complete Water Treating Plan" for boiler feedwater and cooling water treatment. Leaflets cover various aspects of treatment and equipment. — DEADY CHEMICAL COMPANY.



738—Compact Proportioning Pump — Bulletin No. 1107.20-1, 2 pages, describes a plunger-type, small capacity proportioning pump for the accurate and efficient treating of small, low pressure boilers. Includes photograph and dimensional data. — B-I-F INDUSTRIES, INC.

739—Organic Glucosates — 4-page reprint from Chemical Engineering Catalog discusses increased production and decreased replacement costs and maintenance, resulting from application of Organic Glucosates for control of scale, corrosion and algae problems. — D. W. HAERING & CO., INC.

740—Industrial Zeolite Softeners — Bulletin 211, 4 pages, tells how line of zeolite softeners can meet your needs and capacities by elimination of water hardness, efficient and economical operation, and design to fit your particular plant. Equipment and applicational photographs. — INDUSTRIAL FILTER AND PUMP MFG. CO.

741—Boiler Cycle Blowdown — Bulletin 28X7731 provides correct procedures for boiler cycle blowdown. — ALLIS-CHALMERS.

742—Algae Preventive — Bulletin No. PAP-4 explains how algae growths secrete certain aromatic oils which impart foul odors to water systems, and tells how Perolin algae preventive can be used in various cooling systems. — THE PEROLIN COMPANY, INC.

743—Mixers and Mixing — Bulletin 730-5430, 18 pages, gives selection and engineering data on Vorti mixers for rapid mix; Vorti-Floc units for slow mix; and Vorti-Mix disperser for gas dispersion. — INFILCO INCORPORATED.

744—Modern Equipment — Booklet, "An Outline of Modern Water Treatment Equipment," gives table of water impurities and methods of treatment, describes typical water treatment systems and discusses equipment. — PFAUDLER PERMUTIT INC.

745—Boiler Feedwater — 4-page leaflet explains the need for boiler feedwater treatment and tells how problem can be solved by scale prevention, corrosion control, suppression of foaming and carry-over, sludge dispersion, and dosage control. — WESTERN CHEMICAL COMPANY.

746—Corrosion-Free Service — 4-page bulletin tells how to have more years of corrosion-free service with steam and return lines when plant equipment is protected by preventive treatment. — E. F. DREW & CO., INC.

747—Package Pressure Filters — Bulletin No. 106, 4 pages, tells how the filter works and gives engineering data, diagrams, and photographs to supplement text. — L * A WATER CONDITIONING, INC.

748—Antifoams — Brochure HSP-905, 4 pages, covers two antifoams: a light colored water soluble liquid; and a dry brown powder which is a water-dispersible blend of organic dispersing agents and sodium sulfite. Gives 7 case histories. — HAGAN CHEMICALS & CONTROLS, INC.

749—Ion Exchange — Bulletins discuss Two-Bed De-Ionizers and Mixed-Bed De-Ionizers, with photographs to illustrate plant applications and diagrams to show operation. — ILLINOIS WATER TREATMENT COMPANY.

750—Treating Units — Bulletin 1825-D, 28 pages, explains "The ABC's of the 'Accelerator' Treating Plant," covering operational features and distinguishing characteristics, and including applicational photographs in a variety of industries. — INFILCO INCORPORATED.

751—Valveless Gravity Filter — 8-page bulletin describes automatic valveless gravity filter for use wherever gravity flow is feasible,

including current applications at industrial plants treating water for both process and potable use. — PFAUDLER PERMUTIT INC.

752—High Pressure Boilers — Scale, foaming, carryover, pitting and corrosion controlled with Mogul — data sheet highlights services available. — THE NORTH AMERICAN MOGUL PRODUCTS COMPANY.

753—Package Zeolite Water Softeners — Bulletin No. 105, 8 pages, explains softening water with zeolites, describes package water softeners, model types, layout dimensions, and gives engineering data. — L * A WATER CONDITIONING, INC.

754—Testing Equipment — Catalog information on complete line of water testing sets to determine hardness, alkalinity, and other chemical properties. — THE BIRD-ARCHER CO.

755—Steam & Return Lines — Data sheet shows you how Mogul steam and return line treatment counteracts acidity in condensate, protecting entire system and saving costly repairs. — THE NORTH AMERICAN MOGUL PRODUCTS COMPANY.

756—Reactivator — Bulletin WC-103A, 12 pages, explains coagulation, softening by the cold lime-soda ash process, and describes the operation of the Graver reactivator for rapid, economical water clarification and softening. — GRAVER WATER CONDITIONING CO.

757—Zeolite Softeners — Index 3.01 (4520-E), 12 pages — Describes sodium zeolite softeners featuring hydromatic single control valve. Covers process, sizing the equipment, selection of zeolite material, operation of zeolite softeners, and details of construction. — COCHRANE CORPORATION.

758—Consulting Services — Bulletin D1, 16 pages, "Nalco Consulting Services and Contract Research," describes scope of Nalco consulting services and contract research. — NALCO CHEMICAL.

759—Algae Inhibitor — Bulletin highlights Mogul Algicide for evaporative condensers, heat exchangers, air conditioners, cooling towers, compressor systems and other systems where water is exposed to atmospheric contamination. — THE NORTH AMERICAN MOGUL PRODUCTS COMPANY.

Buyer's Directory

This tabulation lists many of the important water treatment suppliers and their representatives in the South and Southwest. Some manufacturers, however, failed to furnish information requested.

ALLIS-CHALMERS MFG. CO. Milwaukee 1, Wisc.

Alabama, Birmingham 9: G. H. Hoffman, 1824 29th Ave. South, Phone TRemont 9-8621
Florida, Jacksonville 7: S. B. Lamica, 1628 San Marco Blvd. Phone EXbrook 8-6441
Florida, Miami 32: W. E. Scott, 25 S.E. 2nd Ave. Phone FRanklin 9-5691
Florida, Tampa 2: Y. S. Hogg, Jr., 405 S. Morgan St. Phone 2-8371
Georgia, Atlanta 3: J. M. Duncan, 57 Forsyth St., N.W. Phone JAckson 2-7116
Louisiana, New Orleans 12: J. E. Watson, Jr., 210 Baronne St. Phone JA 5-8623
Louisiana, Shreveport 23: L. G. Park, 624 Travis St. Phone 2-3274
North Carolina, Charlotte 6: C. B. Rumble, Jr., 300 E. 7th St. Phone EDison 4-1667
Oklahoma, Oklahoma City: H. L. Pickens, 401 N. Harvey. Phone CEntral 9-1631
Oklahoma, Tulsa 3: R. I. Moore, 320 E. Archer St. Phone GIBson 7-9163
Tennessee, Chattanooga 2: J. W. Roberts, Hamilton National Bank Bldg. Phone AMherst 6-5101
Tennessee, Knoxville 2: A. R. Knauss, 531 S. Gay St. Phone 2-2165
Texas, Abilene: J. S. Barnett, 412 First National Bank Bldg. Phone ORchard 4-3472
Texas, Amarillo: Wm. M. O'Connor, Amarillo Bldg., 301 Polk St. Phone DRake 3-1766
Texas, Beaumont: T. G. Smith, 490 Orleans St. Phone TErminal 5-2535
Texas, Corpus Christi: R. H. Godeke, 416 N. Chaparral St. Phone TUlip 3-8521
Texas, Dallas 2: H. L. Reynolds, 1800 N. Market St. Phone RIVERSIDE 2-7144
Texas, Fort Worth 1: Karl J. Ratliff, 408 W. 7th St. Phone EDison 2-8331
Texas, Houston 3: D. R. Boise, 1104 Dowling St. Phone CApitol 5-0691
Texas, San Antonio 5: E. R. Hury, 902 Frost National Bank Bldg. Phone CApitol 7-7022

AMERICAN WATER SOFTENER COMPANY, 4th St. & Lehigh Ave., Philadelphia 33, Pa.

Alabama, Mobile: Industrial Power Equipment Co., 951 Government St. Phone HEmlock 2-7802
Florida, Jacksonville 7: Lewis M. Crowe Co., P. O. Box 10007. Phone FLanders 9-5261

Maryland, Baltimore 18: H. P. Rodgers, 100 W. 25th St. Phone Lberty 2-2122
Missouri, Kansas City 11: Hughes Machinery Co., 4212 Main St. Phone VAentine 1-7021
Missouri, St. Louis 17: Rhodes Equipment Co., 1401 S. Brentwood Blvd. Phone WOODland 2-8820
Ohio, Cincinnati 2: Ellman Equipment Co., 1029 Federal Reserve Bank Bldg. Phone MAin 1-3971
Tennessee, Memphis 4: R. E. Overman Co., 2056 Union Ave. Phone BRoadway 5-0844
Texas, Houston: Haylett O'Neill & Son, P. O. Box 1166. Phone JAckson 9-3879
West Virginia, Charleston: Harris Pump & Supply Co., 922 Quarrier St. Phone DICKens 6-0889

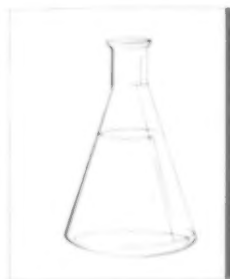
ANDERSON CHEMICAL COMPANY, INC., P. O. Box 1424, Macon, Ga.

Alabama, Andalusia: Ralph Kirkland, P. O. Box 91. Phone CA 2-5243
Alabama, Birmingham 13: David W. Kreutz, 301 Dexter Ave. Phone TR 9-4832
Florida, Jacksonville: L. J. Still, 4010 Ferrara St. Phone EX 8-1020
Florida, Tampa: Graham Severance, 10227 Fleetwood Dr. Phone WE 4-0986
Georgia, Atlanta 18: J. R. Stem, 2141 McKinley Rd., N.W. Phone TR 6-8062
Georgia, Macon: J. W. Anderson, 1320 Briarcliff Rd. Phone SH 2-7919
Georgia, Macon: Marshall Stubbs, 646 Pierce Ave. Phone SH 2-8562
Georgia, Savannah: S. M. Smith, 321 Lindwood Rd. Phone EL 5-5531
Louisiana, Slidell: Earl Absner, P. O. Box 448. Phone 1453-J
Mississippi, Jackson: W. Ray Benton, P. O. Box 8151. Phone FL 3-6808
Missouri, Springfield: H. L. Stem, 2605 E. Linwood. Phone TU 1-1130
North Carolina, Charlotte 1: R. M. Holmes, P. O. Box 10131. Phone EM 6-2433
North Carolina, Raleigh: J. A. Duke, 910 Canterbury Rd. Phone TE 4-0900
South Carolina, Columbia: George M. Kellogg, 4719 Reamer Ave. Phone SU 7-6315
Tennessee, Chattanooga 11: W. MacPherson, 606 Maple Lane. Phone MA 2-0283
Tennessee, Memphis 2: Branch Office, P. O. Box 2432, DeSoto Station

Tennessee, Memphis: Wilson T. Walsh, 950 Cullenwood, White Haven. Phone EX 8-1642
Texas, Texarkana: William H. Moore, 2441 Oaklawn Dr. Phone 32-8894

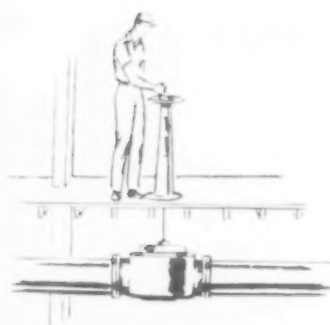
BETZ LABORATORIES, INC., Gillingham & Worth Sts., Philadelphia 24, Pa.

Florida, Pompano Beach: F. W. Hanaway, 2631 N.E. 48th St. Phone WHitchall 1-5653
Georgia, Atlanta 19: J. W. Wallace, 2763 Winding Lane. Phone MEIrose 6-2470
Georgia, Devatur: A. D. Eichers, 2862 Monterey Drive. Phone BUtler 9-4744
Kansas, Wichita 8: W. P. Woodward, 346 Oakwood Drive. Phone MUrray 3-0286
Kentucky, Pleasure Ridge Park: L. L. Bowman, 5213 Witten Drive. Phone WA-rich 1-0357
Louisiana, Kenner: M. E. Smith, 3720 Connecticut Ave. Phone 71-1709
Louisiana, Monroe: S. R. Graham, Route 3, Box 66, Curve Drive. Phone FA 5-5996
Louisiana, New Orleans 23: M. H. Piper, 179 Colonial Club Drive. Phone KENner 4-6057
Maryland, Baltimore 14: C. J. Maag, 8104 Harris Ave. Phone NOorthfield 8-1575
Maryland, Towson 4: E. H. Benjamin, 810 Stevenson Lane. Phone VALley 3-2579
Missouri, Afton 23: F. G. Koenig, 8456 N. Hampshire. Phone FLanders 1-7006
North Carolina, Charlotte 7: V. Braxton, 1000 Linda Lane. Phone EMerson 6-0813



Oklahoma, Norman: T. Blenkinsop, 1004 Brookside Drive. Phone JEfferson 4-7220
Oklahoma, Sapulpa: M. L. Roberts, 500 E. Cleveland St. Phone 2854
Tennessee, Memphis 17: W. L. Latham, 5098 Woodlark Road. Phone MUtual 3-2333
Texas, Houston 35: C. W. Brown, 4726 Waycross Drive. Phone MOhawK 7-7643
Texas, Fort Neches: J. M. Cahal, 1201 West Drive. Phone RA 2-6888

Texas, Portland: W. E. Hoskinson, 119 Hawthorne Place. Phone 4951
Virginia, Roanoke: F. W. Wallenfels, 4343 Holmes St. Phone EMpire 6-6622



B-I-F INDUSTRIES, INC., 345 Harris Ave., Providence 1, R. I.

Georgia, Atlanta 5: W. D. Taulman & Associates, 415 E. Paces Ferry Rd. Phone CEDar 7-0511
Louisiana, Baton Rouge 6: L. H. Johnson, Jr., 256 Peachtree Blvd. at Florida. Phone Dickens 3-4451
Oklahoma, Oklahoma City: Ritzhaupt & Co., 100 Block East 8th St. Phone Vctor 3-1165
Oklahoma, Tulsa 23: Arduser & Co., P. O. Box 3645. Phone Gibson 7-8311
Texas, Amarillo: L. Dodson Engineering Co., 75 Hughes St. Phone DRake 2-1075
Texas, Dallas: E. F. Morey, Jr., 4519 N. Central Expressway. Phone LAKeside 6-8631
Texas, Houston 6: G. J. Wolfer, 2435 North Blvd. Phone JACKson 6-1335
Texas, San Antonio 6: Texas Filter Co. Inc., 300 Blum St. Phone CAPitol 6-6291

BIRD-ARCHER COMPANY, THE, 4337 N. American St., Philadelphia 40, Pa.

D. C., Washington: J. S. Moran, P. O. Box 6946. Phone CHerry 8-4680
Louisiana, Shreveport: G. J. Murray, 724 Ceville Place. Phone UNiversity 5-8207
Tennessee, Memphis: Middle States Assn., P. O. Box 1601

COCHRANE CORPORATION 3110 N. 17th St., Philadelphia 32, Pa.

Georgia, Atlanta 24: Boiler Equipment Service Co., 1079 Alco St., N.E., P. O. Box 15138. Phone MEIrose 4-7373
Louisiana, New Orleans 12: Allan J. Harris Co., 400 Balter Bldg. Phone TULane 0126
Missouri, Kansas City 10: Messplay Machinery Co., P. O. Box 6088. Phone Jefferson 1-1247
Missouri, St. Louis 1: Lane Machinery Co., 419 Buder Bldg., 7th & Market Sts. Phone CEntral 1-0011
North Carolina, Charlotte 2: Brown & Morrison, 207 Liberty Life Bldg. Phone EDison 3-0774
Ohio, Cincinnati 37: The Henry P. Thompson Co., Roselawn Roger Bldg., 1720 Section Road. Phone ELMhurst 1-3140

Tennessee, Knoxville 17: Dickey Engineering Co., 3009 Central Ave., N.W. Phone 4-8641
Texas, Amarillo: S. C. Covington Co., Inc., Amarillo Bldg. Phone DRake 3-5021
Texas, El Paso: Associated Engineers, 511 Hawkins Road, P. O. Box 600. Phone PROspect 2-5233
Texas, Houston 1: Alliger & Sears Co., 2203 Fannin, P. O. Box 2217. Phone CAPitol 4-6933
Virginia, Richmond 6: The Hawkins-Hamilton Co., Inc., 401 American Bldg. Phone MILton 3-0153

CULLIGAN, INC., Northbrook, Ill.

Florida, St. Petersburg 9: Robt. E. Morley, 5198 61st Lane, N. Phone HEMlock 5-8571
Kansas, Prairie Village: J. Robt. Jacobs, 4908 West 70th St. Phone HEDrick 2-9119
Texas, Houston 17: H. J. Mitchell, 10230 Bessemer. Phone HUDson 4-1498
Texas, Lubbock: John O'Donnell, 4211 42nd St. Phone SWift 9-5980
Virginia, Roanoke: Jack Rodhe, 3073 Timberlane Ave., S.W. Phone DIamond 3-5537

DEADY CHEMICAL COMPANY, 1401 Fairfax Trafficway, Kansas City 15, Kans.

Alabama, Mobile: Earl T. Ehman, P. O. Box 6031
Kansas, Kansas City 15: Ken E. Shreeve, 1401 Fairfax. Phone MAYfair 1-3569
Kansas, Kansas City 15: Ted A. Tobin, 1401 Fairfax. Phone MAYfair 1-3569
Louisiana, Baton Rouge 8: Gus Paillet, 4824 Woodside Drive
Louisiana, New Orleans: James D. Maddox, 171 Audubon
Louisiana, New Orleans: Walter B. Moses, 171 Audubon
Mississippi, Jackson: H. T. Allen, P. O. Box 9806, Northside Station
Missouri, St. Louis: Parker P. Powell, Room 308 — 705 Olive St. Phone CH 1-7393
South Carolina, Sumter: Lawrence G. Ammons, 46 Dunnway. Phone SPRuce 5-2473
Tennessee, Memphis: R. S. Bronaugh, P. O. Box 1782. Phone BRoadway 4-1672

DEARBORN CHEMICAL COMPANY, Merchandise Mart Plaza, Chicago 54, Ill.

Florida, Clearwater: W. W. Clark, 1107 Drew St. Phone 31-8524
Georgia, Decatur: L. J. King, 765 Iris Terrace. Phone MEIrose 6-3223
North Carolina, Greensboro: H. B. Lewis, 409 Westdale Place. Phone BRoadway 2-1351
Oklahoma, Ponca City: R. D. McGee, 1042 N. 3rd St. Phone ROgers 5-6784
Oklahoma, Tulsa 3: R. W. Kelly, 211 Midco Bldg. Phone Gibson 7-4878
Tennessee, Nashville 4: G. E. MacLean, Southeastern Dist. Mgr., 726 16th Ave. South. Phone CHapel 2-0262
Tennessee, Nashville 14: B. U. Moss, 2445 Vale Lane. Phone TUrner 3-7104
Texas, Dallas 6: E. M. Welch, Southwestern Dist. Mgr., 5526 Dyer St. Phone EMerson 8-2050

Texas, Dallas 6: W. R. Trawick, 5526 Dyer St. Phone EMerson 8-2050
Texas, Fort Worth 16: B. E. Woodall, 5033 Fairfax. Phone PErshing 2-0825
Texas, White Deer: J. R. St. Clair, P. O. Box 157. Phone TULip 3-4601

DREW & CO., INC., E. F., 15 East 26th St., New York 10, N. Y.

North Carolina, Asheville: M. M. Matthews, Southeastern Dist. Mgr., 351 Lakeshore Drive.
Texas, Dallas 4: K. W. Renson, Southwestern Dist. Mgr., 3814 San Jacinto.

ELGIN SOFTENER CORPORATION, 132 North Grove Ave., Elgin, Ill.

Florida, Neptune Beach: Mayfield & Son Inc., 1102 First St. Phone CHerry 9-2076
Georgia, Atlanta 5: Stephen C. May, 5551 Ivy Road, N.E. Phone CEDar 7-1162
Louisiana, New Orleans 15: Betz Engineering Sales Co., 1719 Toledano St. Phone WInbrook 5-8691
Maryland, Baltimore 18: Lamb Engineering Co., 2125 Maryland Ave. Phone BELmont 3-4740
Missouri, Kansas City: F. S. Crook, Inc., 1415 Pennsylvania Ave. Phone Vctor 2-6200
Missouri, St. Louis 1: F. S. Crook, Inc., 1004 Market St. Phone EXpress 7-1441
Ohio, Cincinnati 36: BC Engineering Co., 6900 Silverton Ave. Phone TWeed 1-6122
Oklahoma, Tulsa 23: Arduser & Co., 303 S. Frankfort Ave. Phone Gibson 7-8311
Tennessee, Nashville 3: Harwell Allen & Associates, 1121 Church St. Phone ALpine 6-6208
Texas, Corpus Christi: Stanley Kerr, 3534 Pecan St. Phone ULYssee 2-2821
Texas, Dallas 35: Paul Simmons Co., 2712 W. Mockingbird Lane. Phone FLEetwood 7-2438
Texas, Houston 5: Plant Equipment Co., 2401 Dunstan Road. Phone JACKson 9-0131
Texas, San Antonio 2: L. H. North, 328 Mulberry Ave. Phone PErshing 2-2938
Virginia, Richmond 20: Berkness Control & Equipment Co., 308 W. Cary St. Phone MILton 3-5357

FAIRMOUNT CHEMICAL CO., 136 Liberty St., New York 6, N. Y.

GALE SEPARATOR CO. (Division of Inflico Inc.), 901 S. Campbell, Tucson, Ariz.

Texas, Dallas 19: Huster Machine Tool Co., 1768 Proctor St. Phone FLEetwood 7-5808
West Virginia, Charleston: D. D. Foster Co., 411 "D" St.

GENERAL IONICS CORPORATION, 5121 Clairton Blvd., Pittsburgh 36, Pa.

Alabama, Birmingham 13: Thomas Engineers
Alabama, Huntsville: James S. Wall
Florida, West Palm Beach: Ever-Soft Water Softeners, 3625 S. Dixie. Phone TEmple 3-2800

Texas, Lubbock: Lubbock Servisoft, 3308
Hartford. Phone SWift 9-3010

GRAVER WATER CONDITION- ING CO., 216 W. 14th St., New York 11, N. Y.

Georgia, Atlanta 5: E. L. Shuff & Assocs.,
Inc., 3120 Maple Drive, N.E. Phone
CEdar 7-9215

Louisiana, New Orleans 13: Coastal Engi-
neering Corp., 1500 Tchoupitoulas St.
Phone EXpress 2194

Missouri, St. Louis 8: Howell Eng. Equip.
Co., 4229 Lindell Blvd. Phone JEFFerson
5-1770

Oklahoma, Oklahoma City 6: Process
Equipment Co., 1824 1/2 Linwood Blvd.
Phone CEntal 2-4757

Oklahoma, Tulsa 16: Process Equipment
Co., 3141 E. 15th St. Phone WEbster
9-7334

Tennessee, Memphis: Engineered Plant
Equip., Inc., 166 Monroe Ave. Phone
JACKson 5-1631

Texas, Bellaire (Houston): Datum Engi-
neering Co., 4618 Birch St. Phone MO-
hawk 5-0893

Texas, El Paso: G. M. Wallace & Co., 512
Electric Bldg. Phone KEystone 2-5439

HAERING & CO., INC., D. W., P. O. Box 10337, San Antonio 21, Texas

Kansas, Wichita: E. P. Pardee, P. O. Box
2274. Phone AMherst 2-1658

Texas, Corpus Christi: P. B. Snyder, 5006
Bevly Dr. Phone ULysses 2-5255

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ATOMIC DEVELOPMENTS

NUCLEAR TECHNOLOGY has now left the hands of the original tight group of narrowly specialized personnel that initiated the program and has been successfully absorbed by normal talents and production channels.

More details on the *N.S. Savannah* have been released and they provide interesting reading for engineers and manufacturers who may have an interest in designing and manufacturing components for nuclear ships of the future. It is significant that the design and manufacturing problems for the first nuclear ship were solved by regular manufacturing firms and engineers from several branches.

Demineralizer

Three demineralizer water units used in the atomic powered merchant ship, the *N.S. Savannah*, were designed by engineers of the Cochrane Corporation. Standing 5 feet high and 30 inches in diameter, the outside of the shells are

covered by 4½ inch thick lead shields to prevent the escape of radioactivity from the internal demineralizer resin beds to the atmosphere surrounding the units.

The purpose of this demineralizer plant is to purify the primary coolant water loop of the nuclear reactor. This primary coolant loop picks up the heat from the nuclear fission and transfers this heat to the secondary loop through a heat exchanger boiler, where steam is formed for the turbines that operate the ship.

A large quantity of water is recirculated through the primary loop and although stainless steel is used, some corrosion products would accumulate in this recirculated stream. These corrosion

products would ultimately deposit on the fission fuel elements and reduce the efficiency of the operation. Also, these corrosion products pick up radioactivity which increase the hazard of maintenance of the secondary heat exchanger boilers.

It is, therefore, essential to purify the primary coolant stream to keep it free from accumulated corrosion products, called "crud," as well as to reduce any dissolved impurities that might enter this primary coolant from any source. The coolant water will thus be kept as clear as possible at all times and as free from dissolved and suspended impurities as required. Only a small fraction of the recirculated stream is passed through these demineralizers on a by-pass system.

After the resin has become exhausted and will not pick up any more radioaction crud or dissolved impurities, the exhausted resin will be sluiced out and replaced by new active freshly regenerated resin of nuclear grade. No regenerations of the resin will take place on the ship. Such replacement of exhausted resin is expected to be required at infrequent intervals.

Shielding

A shielding system, designed without the guidance of precedent or established codes and specifications, by engineers of American Smelting and Refining Company, will make it safe for personnel to perform maintenance work on the *N.S. Savannah's* reactor plant only 30 minutes after the ship's nuclear reactor shuts down.

The extremely conservative dose rates chosen make for an interesting situation. During operation of the ship, a passenger sunning

Atomic classroom at Lynchburg College, Va., is scene of nuclear technology session as six senior deck officers assigned to *N.S. Savannah* discuss problem with instructor. Training of officers and crew in operation of nuclear power plant is conducted by engineers and scientists of the Babcock & Wilcox Company.



By **JOHN F. LEE**

**SPI Consultant on Atomics
Broughton Professor and
Head of Mechanical Engineering Dept.
North Carolina State College**

himself on the main deck will be receiving no more radiation from the plant than from the sky.

The reactor itself is enclosed in a cylindrical primary shield consisting of an inner cylinder of water, 33 inches thick, and an outer shell of lead ranging in thickness from one to 4 inches.

Water, concrete, lead, and polyethylene make up the secondary shield embracing the entire reactor plant, including the reactor proper, steam generators, and reactor auxiliaries.

It is the chamber formed between the inner, or primary, shield and the secondary shield that will be accessible to personnel half an hour after a shutdown. Within it, all components of the entire plant are accessible for maintenance work.

The entire reactor plant is sealed within a steel pressure vessel, a unique structure with the configuration of an egg shell, 35 feet in diameter, 51 feet long, 2 inches thick. In case of a rupture in the reactor system the containment (pressure) vessel is designed to seal in all escaping radioactive steam and water. Base of the secondary shielding, which serves also as mechanical support for the containment vessel, is predominantly concrete along the sides and fresh water shielding tanks directly below. The concrete structure is extended forward to house purification and waste collection and disposal equipment.

Where space requirements forbade the use of standard concrete for the forward extension, a special high-density concrete was used. Where even this was not feasible, lead and polyethylene were employed. The upper half of the secondary shielding, covering the containment vessel, is a layer of lead varying in thickness up to 6 inches, covered, in turn, by polyethylene. The latter is applied to a depth to bring the total shielding thickness throughout to 14 inches.

Because of severe requirements imposed by size and shape of the containment vessel, the secondary shielding is unique in terms of weight, size, and the notably awkward configuration. More than 500

tons of lead was used for shielding, that in the secondary shield having been built up in laminations of 3-by-6-foot sheets caulked with lead wool. Total shielding weight amounts to 1,769 tons.

Lead is the preferred material for radiation shielding because of its density. Shielding effect against the deadly gamma radiation is directly proportional to the density of the shielding material, and lead is the densest of all the commonly available materials. It, therefore, provides maximum protection through shortest distance at moderate cost.

Subjected to both gamma radiation and neutron bombardment, lead, unlike water and many other substances, will not itself become radioactive. Further, because of its smooth surface, it does not tend to gather dust and dirt, particles of foreign matter that may become radioactive themselves. Finally, unlike aggregates such as concrete, pure lead is dependably uniform in density throughout.

However, where shielding requirements are especially severe, it is usually preferred to combine lead and some less dense shielding material, frequently concrete, in a sandwich arrangement. This arrangement disperses the stress over a larger surface, avoiding the concentration of excessive weight on a small area. Hydrogenous substances such as water and polyethylene are effective in screening off neutron bombardment.

Nuclear Hardware

The building of the nuclear power plant for the first atom merchant ship, *N.S. Savannah*, is a story of massive weights and yet of almost infinitesimal measures. Total estimated weight of the reactor system, its containment and shielding, and the propulsion system aboard the 21,000-ton cargo-passenger ship is 4,430 tons. This includes components that range from the 105-ton reactor vessel that will contain the atomic core, to 350-pound studs that will be used to fasten down the reactor "head."

Despite the tremendous weight of the major components, each has been engineered with the same

care and precision required in the making of a fine watch.

The nuclear power plant was designed and built by the Babcock & Wilcox Company. Steel plate 6½ inches thick was used to form the reactor vessel. The atomic furnace measures 28 feet tall and is 9 feet in diameter. Its inner lining is a 0.109-inch layer of stainless steel. This resists the corrosive effect of radioactive fission products carried in the light water coolant of the system under pressure of 1750 psi.

The hemispherical head for the reactor vessel was formed from a single, flat piece of carbon-silicon steel plate. The circular plate measured 152 inches in diameter by 6½ inches thick. The first step was to ultrasonically test for laminations, grain separations or other defects. The surface that was to become the inside of the hemispherical head was then carefully polished and clad with a 0.109 inch thickness of stainless steel.

Forming of Heads

The 34,860-pound head was formed by utilizing a 6,500 ton vertical press, a male die, and a 70,000 pound per square inch tensile cast steel die holder, all specially fabricated for this job. The operating pressure of the press is 3000 psi, which is obtained from a self-contained hydropneumatic system. The press has an operating stroke of 9 feet 6 inches with a 2½ inch cushion.

The male die used was a segmental type with an outside diameter of 8 feet and 3½ inches and a height of approximately 4 feet and 11 inches. It consisted of an inner holder to support the die shoes which were turned to a radius of 4 feet 1½ inches. It was cast from grey iron containing 20 per cent steel with an estimated weight of 52,865 pounds.

The female die consisted of a semi-steel master die holder approximately 13 feet 11 inches in diameter in which inserts were placed to accommodate heads of varying diameters.

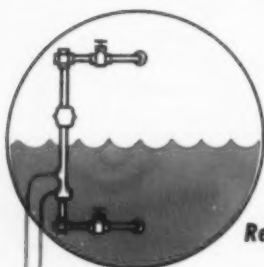
Before the forming operation, the circular plate was heated in a furnace for approximately seven hours to bring the temperature up

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to 2200 F. Then a force of approximately 2,100 tons was exerted to force the plate through the die ring.

After forming, the hemispherical head had an I.D. of 8 feet 2 inches, an O.D. of 9 feet 3 inches and was 4 feet 7 inches tall. Its capacity has been computed to be 1,067 gallons.

The head was then removed from die and thermocouples attached and then placed on a special car which went into furnace with the head. In the furnace it was heat treated at 1600-1650 F for 6½ hours.

Upon removal from the furnace, it was necessary to get the 1650 F head into the spray quencher in less than five minutes. Failure to do so would mean returning the head to the furnace and reheating at 1650 F for one hour. Lost in a shower of spray jets and steam, the head was spray-quenched to insure retention of ductile qualities and absence of brittleness as measured by an impact test.

When temperature of head dropped below 500 F, it was stress-relieved by heating to 1150 F for 6½ hours and allowed to cool slowly in furnace to 600 F, then air-cooled to ambient temperature. The head was then magnafluxed to reveal any surface defects. The stainless steel cladding was tested at 500 psi to assure that it was sound and properly adhered or fused to the carbon-silicon steel plate. The next steps in the fabrication process involved cutting a beveled welding groove on the top edge of the head and welding to the flange forging.

Two heads were used, the top head was welded to the flange as described above, and the bottom hemispherical head was welded direct to the shell by the submerged arc process. All welds of this type were examined by a 2,000,000 volt X-ray unit.

After extensive machining to final dimensions, the head was hydrostatically tested by being submitted to a pressure equal to 1½ times the designed working pressure of 2000 psi.

For this test, and in actual operation, the top head and flange was fastened to the reactor vessel

with 48 bolts and nuts. Each bolt measures 6 feet long by 5 inches in diameter, and weighs 350 pounds. The threads are silver plated to prevent galling. Each nut weighs 50 pounds.

Control Checks

More than 2,500 quality control checks were made on the reactor vessel alone during various stages of its construction. To test its soundness, for example, the vessel was filled with 9,500 gallons of heated, purified water. Water pressure was then steadily increased to 3000 psi, 1,000 pounds above reactor operating pressure, and held at that pressure over a period of time.

Eight miles of stainless steel tubing were used for the Savannah's primary loop. Averaging 27 feet in length and $\frac{3}{4}$ inch in diameter, 812 of these tubes in the dual heat-exchanger system will carry 9,530 gallons of pressurized, superheated primary water at the rate of 8,000,000 pounds per hour through a secondary loop of low pressure water which is converted to steam. These tubes are "pedigreed" in every sense of the word. A complete biography was maintained on every tube.

Control Panel

Bailey Meter Company designed and built the control panel and instrumentation for control and safe operation of the reactor and propulsion systems. The control system provides for automatic "scram" (instant shutdown) for any one of seven abnormal conditions. In such an event, all control rods will be driven to the full down position under a hydraulic force of 1250 psi.

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Other Components

The Diamond Power Specialty Corp., designed the special hydraulic tensioning device used to tighten the 6-foot long studs whose 350-pound weight would otherwise produce excessive thread pressure

(Continued on Page 54)



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To Move or Not To Move? ---- Important to Both Sides

Conducted by ROBERT H. EMERICK, North Charleston, S. C.

MANAGEMENT CLINIC

Question

WE EMPLOY a number of professional grade personnel, mostly electronic, chemical and mechanical engineers. Recently a company in a nearby city, and employing similar talent, has taken on the kind of contract that requires an immediate expansion of their manpower. To get these extra people, they are offering unusually attractive salaries.

Several of our engineers in consequence have explored the possibility of making a change and were told they would be hired "if your present employer is willing to release you."

This has created an unhappy situation, since releasing these men would leave us critically short-handed in a highly specialized department, and yet we can't afford to match the other company's salaries, at least not for the present.

What is our best move in a situation like this: keep our people and be accused of making them "captive slaves," or let them go and do the best we can with what's left?

Answer

YOU MAY NOT be obliged to take either alternative, primarily because your employees are technical people who can be reached by logic. This means the problem can be simplified by developing the correct answer to the question:

"Is the higher salary being offered actually high enough to compensate for the dislocations of moving into another city and into another industrial environment?"

Here is how the balance could be presented to a logically minded employee, from his viewpoint.

FAVORABLE TO CHANGE

1- A much higher salary than I'm getting at present.

UNFAVORABLE TO CHANGE

1- The new company pays only part of my moving expenses. This will cause me to be out of pocket by a couple of hundred dollars.

2- What will happen to me when this big contract is completed? If a reduction in force results, I'll have little or no seniority. Will I have to move again to find work?

3- Will my children be set back in school anywhere from a half to a full term?

4- Will my family be unhappy at leaving their friends, church, and relatives?

5- Will I forfeit all my present pension rights by the move?

6- If the move is to another state, must I take out a new professional practice license in that state?

7- Is my chance for promotion better with my present employer who knows my capabilities, than with a stranger who must be sold?

The Clinic suggests that the balancing of pros and contras be shown to the involved personnel, so that each can make his own decision. Furthermore, a frank statement by the company explaining why it can't at present match those other salaries, and indicating if and when increases might be possible, will go a long way toward building good employee relations.

We would expect most of those who were tempted by what looked like greener grass elsewhere, when shown the actual balance sheet and when reassured by the company statement, to stay where they are. The others, if any, should be released. You'll be better off without them.

5½ Miles 100 TPH

A BELT CONVEYOR 5½ miles long carries 1,000 tons of crushed limestone per hour from its Lawrence, Oklahoma quarry to Ideal Cement Company's new mill at Ada, Oklahoma.

Ideal is one of the largest cement producers in the United States and its new all-weather conveyor system is the first major conveyor ever supported by prestressed concrete structures.

The new conveyor was engineered, fabricated and erected by Link-Belt Company and consists of seven separate belt conveyors arranged consecutively to feed on to each other. In its cross-country course, the system changes direction four times, and from the air, looks like a giant letter "S" as it winds through the rolling Oklahoma countryside.

The conveyor crosses two highways and the Frisco and Santa Fe railroads, and provision has been made at numerous points for passage of cattle and farm equipment over the conveyor, since the right-of-way is across farm land for the most part.

The longest conveyor, almost two and a quarter miles in length, is the longest single flight ever built. It required an endless rubber belt 4½ miles long. Although it travels at the rate of 500 feet a minute, this belt makes only ten round trips during an eight-hour day. By contrast, the shortest flight is 550 feet long.

The conveyor carries crushed limestone four days a week and shale on one day. The limestone is crushed to ¾-inch size in a crushing plant at the quarry end of the system, while the shale by-

passes the secondary crushers and proceeds directly over the 5½-mile conveyor system. The conveyor system operates eight hours daily, five days a week.

Controls

A single push button puts the entire 5½-mile system in operation. When the "start" button is pressed, the belt conveyor closest to the mill, the discharge end, starts immediately, and after its tail pulley has reached about 50 per cent of normal operating speed, a relay starts the next conveyor in line. This in turn starts the one ahead of it, and so on until the first conveyor at the quarry end is running at full speed. This starting sequence takes about five minutes when the system is fully loaded.

Due to its length and capacity, and its importance to the operation of the cement mill, elaborate steps have been taken to insure adequate power to start the belts under every conceivable condition of loading and to control the tremendous inertial forces which would be released in the event of power failure.

Since a power failure would stop all motors simultaneously, provision has been made for the conveyors to have a longer coasting time progressively from the quarry to the mill. This was done

either by dynamic braking to shorten time of coast down or by providing inertia in the form of fly wheels to extend the time of fly wheels to extend the time of coast down. Safety devices include latest techniques for interlocking and automatic control.

Concrete Stringers

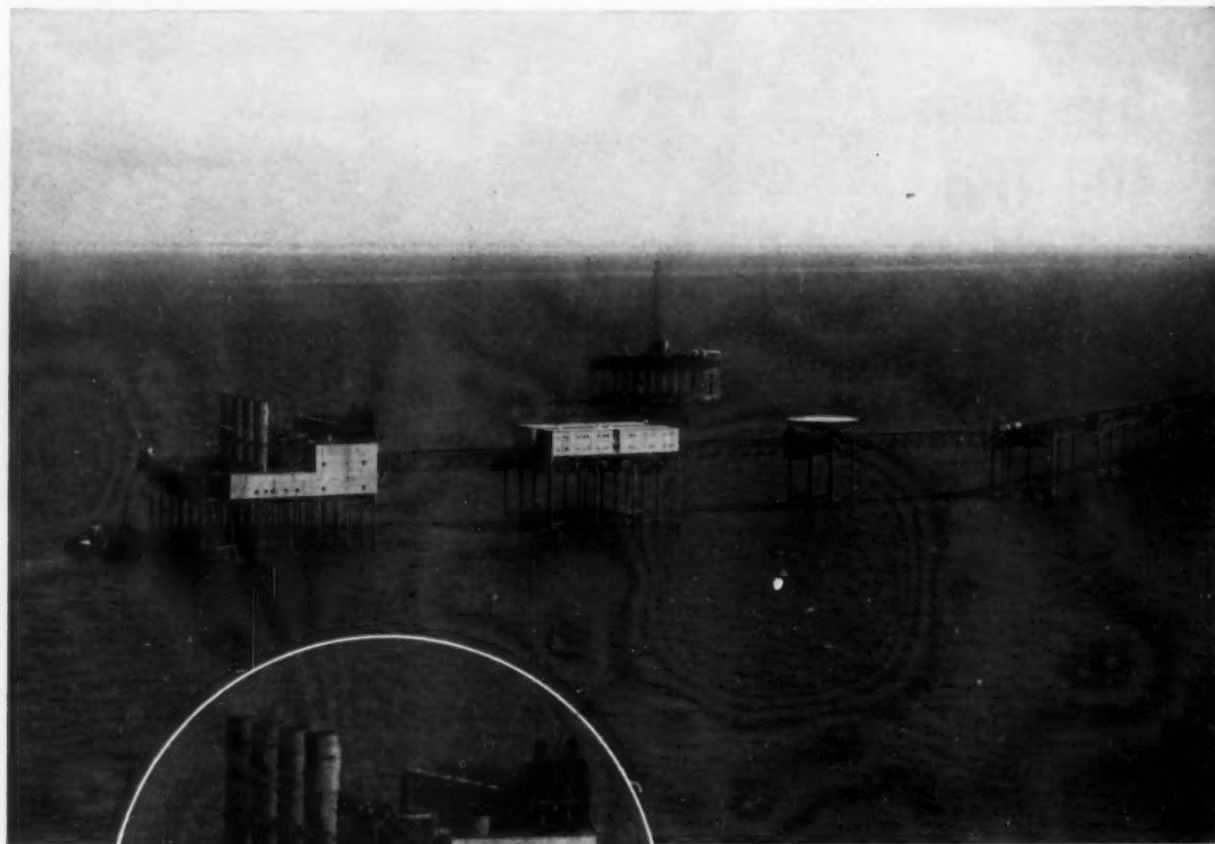
In a radical departure from steel-supported conveyors, the belts are supported by precast, prestressed concrete channel stringers spanning 50 feet. In addition to supporting the conveyor, the stringers form a cover over the top of the belt. One side of the conveyor is curtained by a continuous corrugated aluminum wind guard. The stringers rest on precast reinforced concrete U-stands.

Where the conveyor is raised to clear highways and railroads, the U-stands are mounted on the top flanges of prestressed concrete girders or on elevated piers. Where spans exceed 50 feet, the conveyors are mounted on the girders, and their flanges are made sufficiently wide to serve as walkways.

In the entire final conveyor, which is elevated to cross the main line of the Frisco Railroad, the conveyor stringers are carried on a series of 97-foot prestressed concrete girders which rest on four-legged towers about 30 feet high.



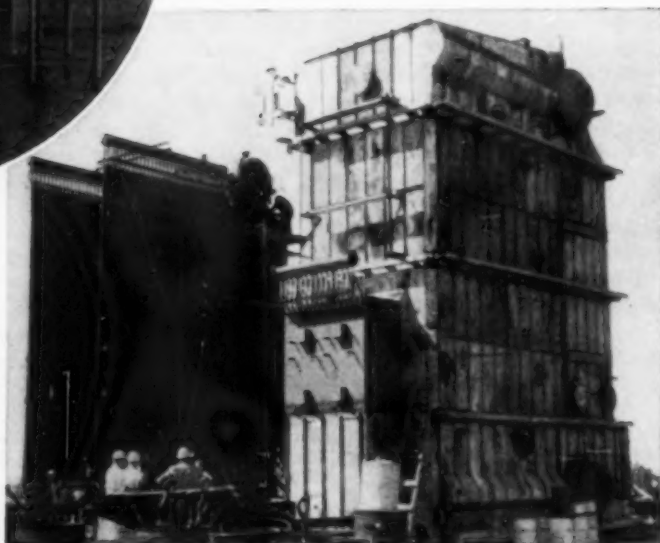
FOUR RILEY Boilers Help



Four Riley Type RX Pressurized Boilers. Capacity 90,000 lb/hr — 625 psig — 600 F. Fuel — Natural Gas, Turbine Exhaust Gas.

Low excess air, refractory elimination, uniform heat distribution and absorption are the desirable characteristics of the Riley Intertube Gas Burners. Prefabricated assembly of boilers assists in delivery and speeds construction.

A careful survey of your plant by a qualified consulting engineer could show ways of making substantial savings in power costs.

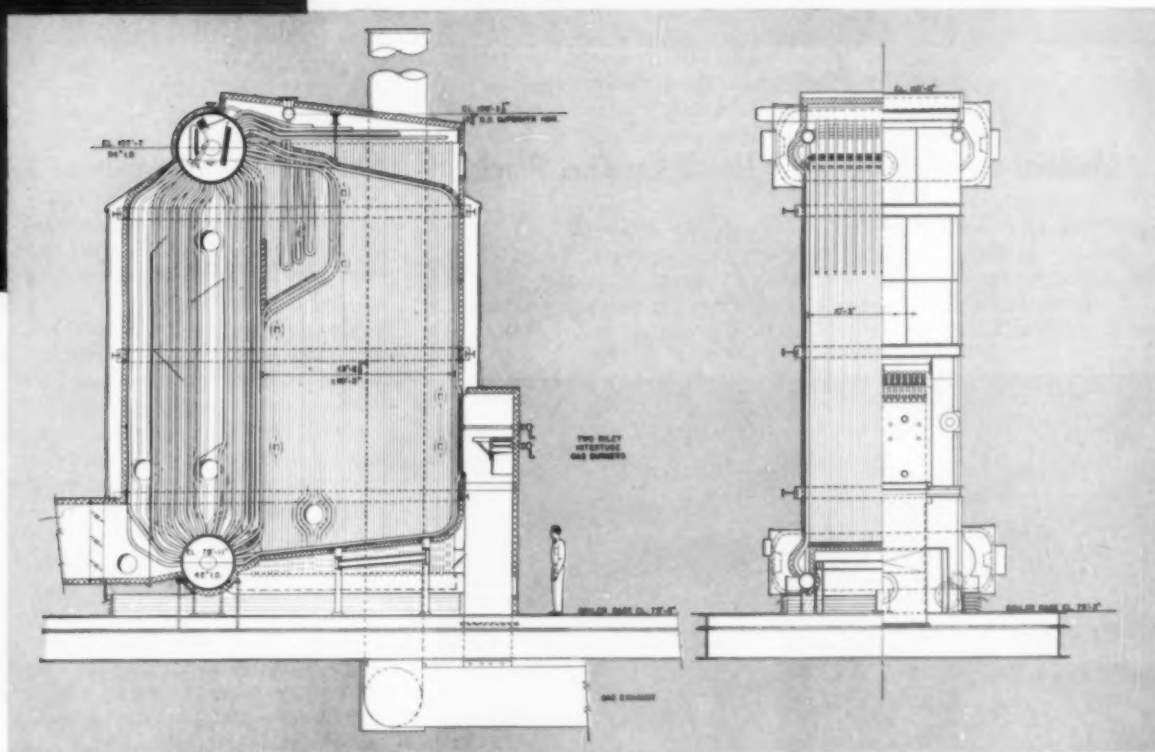


Mine Sulphur Seven Miles At Sea

Freeport Sulphur Company has installed four 90,000 lb/hr Riley type RX Pressurized Boilers on the World's largest man-made structural steel island in 50 feet of water seven miles out in the Gulf of Mexico (off Grand Isle.) These boilers will supply steam for electrical generation and steam for the Frasch Process of mining ancient brimstone deep below the Gulf's floor from a platform 75 feet above the water line.

Boiler settings must be strong enough to withstand hurricane force winds, vibration free, and light in weight.

Here is another example of how Riley designs and builds boilers to meet unusual engineering specifications. Let your Riley sales representative provide you with up-to-date information about Riley boilers and fuel burning products.

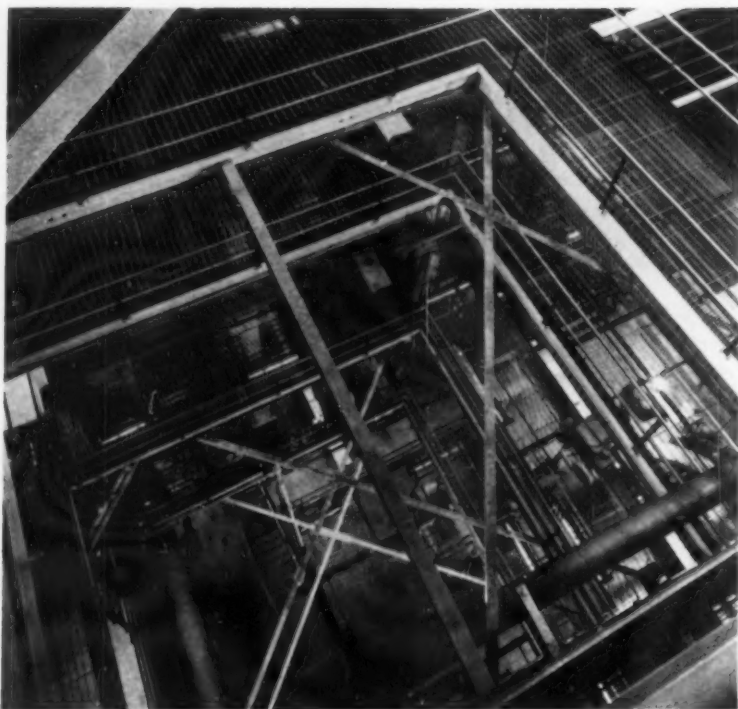


You'll Find A Riley Representative In Each Of These Principle Cities:

Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Houston, Jacksonville, Kansas City, Los Angeles, New Orleans, New York, Philadelphia, Pittsburgh, Portland, Salt Lake City, San Francisco, Seattle, St. Louis, St. Paul, Syracuse, Boston.

RILEY
STEAM GENERATING & FUEL BURNING EQUIPMENT

RILEY STOKER CORPORATION, WORCESTER, MASS.



Grating

NOW IN OPERATION in Memphis, Tennessee, is the new 862,500 kw Thos. H. Allen Electric Generating Station. Like the majority of industrial plants today, grating, or open metal flooring, was chosen for both safety and low maintenance. And some 200,000 square feet of Kerrigan grating and 2,000 stair treads are now contributing to the safe movement of workers, hand trucks, etc., on five floors in this plant. In this design, the grating's spiral cross bars are twisted, alternate right and left, and are slightly raised above bearing bars, for additional safety underfoot. The open steel type floor has self cleaning properties which hold to a minimum the collection of dirt, oil and grease.

Modern Lighting for New North Carolina Plant

MODERN, well lighted parking lots — in keeping with the trim architectural appearance of P. H. Hanes Knitting Company's new \$2 million facility — are pro-

vided for employees at the recently completed Winston-Salem, N. C. plant.

When the fabric manufacturing facility swings into full operation

later this year, night shift workers will enjoy the comfort, safety and convenience of vision-engineered lighting systems in two new parking areas and on streets adjacent to the plant.

Two-lamp, six-foot luminaires, mounted on davit-type aluminum poles, supply approximately 1.2 foot-candles of maintained illumination in the parking areas. There are 32 units installed in Hanes two new lots and the streets in front of the plant. The luminaires were manufactured at Hendersonville, N. C., by the Outdoor Lighting Department of General Electric Company.

Each unit supplies 11,500 lumens from high-output lamps. The soft fluorescent source produces a light distribution that provides uniform pavement brightness without objectionable glare.

The lighting is expected to permit faster, more efficient truck handling at night in the loading area located at one end of the larger parking area. Similar industrial installations have shown that lighting of this type acts as a deterrent to thieves and vandals.



A New Concept for Handling Industrial Waste

A REVOLUTIONARY type of plastic packing for the biological oxidation of municipal and industrial liquid wastes has been developed and tested by the Dow Chemical Company. The new product is now being used to treat synthetic textile and domestic wastes at the company's own modern secondary treatment plant at Williamsburg, Virginia.

The treating plant consists of comminution, primary sedimentation, lagooning, chemical precipitation, biological oxidation using Dowpac, secondary settling and vacuum filtration.

The oxidation towers (trickling filters) which treat a rather specific organic waste, are one of the first industrial applications of Dowpac in the South. Highly selective biological slimes exist in the 21 foot deep units — one unit being packed with saran, the other with polystyrene Dowpac.



Oxidation tower utilizing Dowpac (Dow polystyrene). Installed at the James River Division of The Dow Chemical Company, these trickling filters oxidize organic wastes from the synthetic fiber plant prior to settling and discharge.

This media for bacterial growth consists of individual sheets (either saran or polystyrene) corrugated in two directions and assembled into self-supporting packing modules. Because of the media's void space (94%), large surface area, and lightweight (3.6 - 6.0 lbs/cu ft) structural properties, improved performance can be obtained with smaller volumes of packing.

These properties permit the

elimination of primary sedimentation in some applications and save on land area. Dowpac can be stacked to great heights (up to 42 feet) without curtailing aeration, and can be field assembled for convenient installation.

By **RONALD D. SADOW**, Engineering Department, James River Division, The Dow Chemical Company.

Strange Motor Behavior

IN OUR PLANT, we have a three phase closed delta system, 19,000 volts, 60 cycle primary, 230 volt secondary, with a monthly demand from 1200 to 1400 kva. We do not have a neutral and use dry transformers for lighting.

Recently, it was urgent to start and run three new small motors. Proper starting equipment was not readily available. Two of the motors were three phase, one single phase. These motors were tied parallel on one source temporarily. When the wiring was completed, the switch was thrown and all three motors started, but before they came up to speed, one of the

three phase motors slowed and stopped, then started in reverse.

The electrician that wired the motors phoned me and, in company with several other engineers, I went into the plant to see this unusual performance.

I threw the switch in and out several times and witnessed the same sequence of events that the electrician had described to me over the telephone. I had the wiring checked.

It was found that one phase was grounded to a Greenfield connector, where the wire was bent sharply in one of the three phase motor terminal blocks. This had blown a

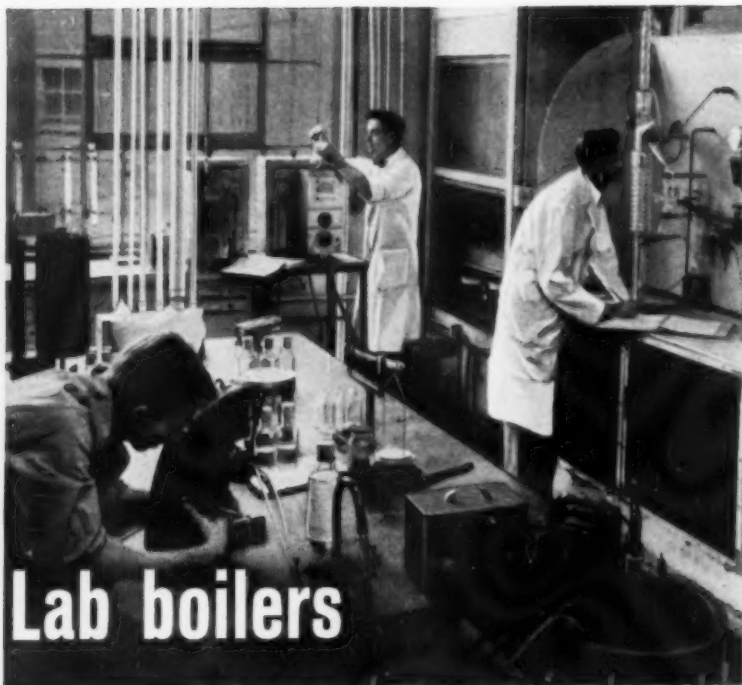
fuse. This phase that was grounded was the phase that did not feed the single phase motor.

The three phase motors then must have started from an undetermined inductive ground. Counter voltage was, in my opinion, responsible for the odd motor behavior. When the ground was repaired and the fuse replaced, the motors operated normally.

Many theories have been advanced as to why this happened. What is your solution? The two three phase motors? The single phase motor? Or the ground?

The three motors now operate 16 hours per day and I have not done any further checking.

By **E. L. HAWLEY**, Elect. Engr., Scripto Inc., Atlanta, Ga.



Lab boilers

meet every test!

Two Cleaver-Brooks 150-hp boilers satisfy all demands for steam at Shell Chemical Corporation's Union, New Jersey Technical Service Laboratories

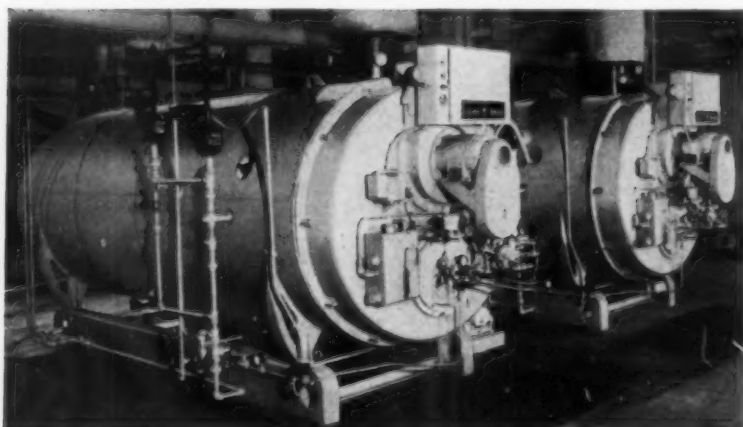
"We find Cleaver-Brooks boilers meet every test we have given them for top operating performance," reports George Baranchuk, utilities and service engineer at Shell's research building. Mr. Baranchuk goes on to say, "There is extreme versatility to our load as our requirements for heating and experimentation may run as low as 10 hp in the summer to over 140 hp in the winter. Checks we have made of CO₂ and stack temperatures indi-

cate we are getting excellent operating efficiency — even when we vary the load over widely separated peak and low demands. These boilers have definitely lived up to every claim you have made for them."

Put Cleaver-Brooks packaged boilers to the test! They are available in sizes from 15 to 600 hp . . . for oil, for gas or for oil/gas combination firing. Contact your representative or write Cleaver-Brooks Company, Dept. A, 305 E. Keefe Ave., Milwaukee 12, Wisconsin.

Cleaver-Brooks®
ORIGINATORS AND LARGEST PRODUCER
OF PACKAGED BOILERS

TESTING — Fully modulated Cleaver-Brooks boilers burning No. 6 oil supply steam for heating presses, constant temperature rooms, laboratory uses, laminating plastics and air conditioning system. Sold and serviced by Miller & Chitty Company, Union, N.J.



Atomic Developments

(Continued from Page 47)

during closure operations on the reactor head.

The Babcock & Wilcox Nuclear Facilities Plant at Lynchburg, Va., built the reactor core, which is 62 inches in diameter and 66 inches high. Inside the honeycomb-like core will be 32 fuel elements, each containing a bundle of 164 stainless steel clad fuel rods arranged in four bundles of 41 rods each.

To control the fission process, the reactor uses 21 boron stainless steel control rods. Raising and lowering the control rods regulates the amount of heat generated.

The advanced pressurized water reactor incorporates the latest design and structural features that will assure safe and reliable operation over a predicted core life of 3½ years on its initial fuel loading.

The reactor core is expected to be installed aboard the *Savannah* sometime in December, 1959, with sea trials for the world's first atom-powered merchant ship scheduled to begin in the spring of 1960.

Improved Shut-off

A RECURRING problem in our plant is the periodic plugging up of discharge connections to tanks used to store water, oil drainings, etc., and sometimes the shut-off valves need repair.

In order to remove such pipes or valve, it usually meant draining the tank first or incurring spillage of the contents.

So repairs could be made, including removal of the main shut-off valve, while such tanks are full, we partly fill a strong sugar bag with sand, tie it firmly to the end of a long pole, lower it in the tank and press it against the drain opening. When the pipeline is dismantled, suction of the liquid in the line draws the sandbag into the drain, forming a seal until repairs are finished.

By S. CLARK, Maintenance Supervisor, U. S. Phosphate Co., Tampa, Florida.



**formation of Scale
and Corrosion
in boilers
WITH**



BRAXON **internal
feedwater treatment**

BRAXON is a specially formulated feed-water treatment that conditions water so as to remove and prevent scale formation and corrosion in boilers. BRAXON bases its effectiveness on phosphate and carbonate control . . . maintaining the proper alkalinity and softness in the feedwater. Special BRAXON formulas inhibit the tendency of some feedwaters to produce foam-

ing and carryover. No single formula can be applied successfully to all the various types of boiler feedwater. BRAXON formulas are prepared specifically for use in *YOUR* plant after a careful analysis and study of raw water used. Your BRAXON formula will keep your boiler operating at top efficiency, eliminating shut-downs and repairs caused by corrosion and scale.

Write today and request an Anderson service engineer to make an analysis and recommendations on your plant's water treatment. There's no cost for this service.

**SPECIALISTS IN MAKING
WATER BEHAVE**



Anderson Chemical Company, INC.

Macon, Ga., Box 1424 • Phone Sherwood 5-0466
Memphis, Tenn.: Box 2432, DeSoto Station • Phone: BRoadway 2-2806

Keeping Dust Out While Grinding Collector Rings

By R. W. SPEAS, Hydro Plant Supervisor
Kanawha Valley Power Co., Charleston, W. Va.

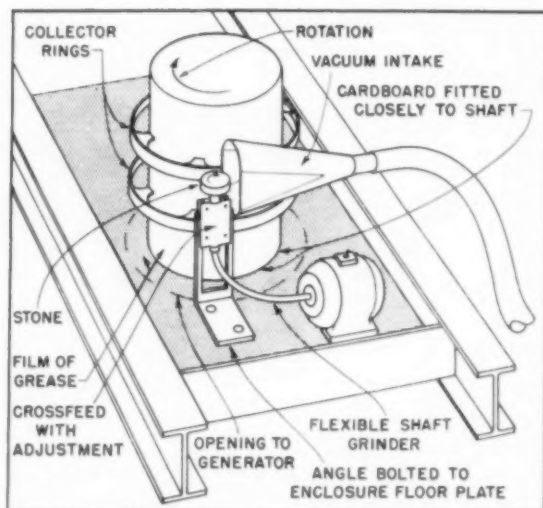
GRINDING collector rings while still in place on vertical hydro generators, with the shaft turning at rated speed, will shape these rings properly for full-load operation. By avoiding dismantling and reassembly, this method saves about 32 man-hours each time the rings are ground (about once a year or so) on each of our 9 generators. However, there is also a disadvantage, since copper and abrasive particles can easily fall into the bearings and windings of these vertical machines.

To solve this problem we used the following methods, as shown in the drawing:

A temporary shaft seal of cardboard was devised and taped firmly in place to prevent grinding products from entering the machine. A gasket cutter was used to cut the cardboard so it would fit snugly around the generator shaft.

An industrial-type vacuum cleaner was fitted with a large intake funnel. This was used to remove the dust as it was leaving the grinding tool.

For further protection, the cardboard seal was greased so that any dust particles not removed by



HOW TO PROTECT vertical water-wheel generators from dust that usually gets into bearings and windings when collector rings are ground.

the vacuum system would cling to the surface of the cardboard and not get into the generator.

After the collector rings were ground, we used this same protection and vacuum funnel for removing carbon particles created as the new brushes were being seated. These precautions have been successful in holding down dirt to a point that makes it unnecessary to clean either the windings or the bearings.



Better Way to Paint Ceilings

AIRCRAFT plant personnel recently faced the problem of painting a saw-tooth type, corrugated, factory ceiling. The job involved painting a total of 246,750 square feet (made up of 329 bays of 750 square feet each).

Production in the plant could not be interrupted at any time, so the maintenance department, using a new Graco Hydra-Spray (pressure atomization) applied the mill white. The specified mil thickness was accomplished in one coat, using a spray tip producing a nine inch fan width.

Painting overhead in a busy, open truss factory proved to be no problem. Production workers on the floor below were seldom aware of the fact that painting crews were working overhead. Drop-cloths were practically non-existent because overspray was virtually eliminated.

At the same time, this lack of overspray reduced health hazards and eliminated the need for respirator hoods or masks, which meant increased visibility — a prime factor when working in high and dangerous overhead areas.

With Hydra-Spray they used only one, lightweight paint hose (no atomizing air hose required) which added considerably to flexibility and reduced fatigue.



NEW Product Briefs

... there is always a **BETTER WAY**

Bus Duct

M-1 A new system for distributing electricity in industrial plants and commercial buildings has been introduced by the **BullDog Electric Products Division of I-T-E Circuit Breaker Company**. Called "XL" duct, the product is exceptionally flexible, easy to install, and features plug-in power take-offs at any place along the line without disconnecting the main power line.

The new duct will be available in ampere ratings of 225 through

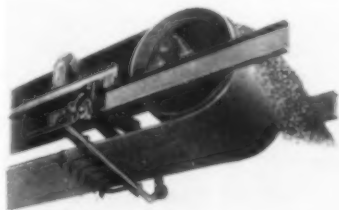


1000 amperes, voltage ratings through 600 volts a-c, single phase, 3-phase, and 4-wire, and full neutral available in all sizes. Separate plug-in switches may be attached easily and safely at almost any point and detached and moved at any time, even while the power is still on. The duct is available in convenient 10-foot lengths for easy handling and installation. Elbow units have been designed for turns in the line; short end-pieces are also available.

The new bus plugs are particularly safe. When installing a bus plug, the plug-in cover must be closed until the switch plug is in a safe position, and it cannot be attached or removed while the switch is in the "on" position. It is almost impossible for an electrician to touch a live bus bar.

Belt Cleaner

M-2 The new Spring Type Belt Cleaner is the result of years of experiments and tests with power driven brushes, beaters, water sprays, air jets and



various types of scrapers by **Stephens-Adamson Mfg. Co.**, Aurora, Illinois.

The cleaner consists of a row of thin, spring steel wiper blades, each with an individual pressure spring. The blades are set perpendicular to the belt surface, but diagonal to travel of belt. Pivoted connections between blades and springs permit wiping edges of blades to seat uniformly on the surface of the returning belt. As the belt passes over the cleaner, each blade wipes a path clean and dry. As blades overlap, the entire carrying surface is cleaned.

Overload Indicator

M-3 Protecta-Trol, an overload indicator and controller for water clarification units, has been developed by **Graver Water Conditioning Co.**, 216 West 14th Street, New York 11, N. Y. The device registers sludge overload on an indicator and has contacts for alarm or light signals and for shut-down of the unit. It is being offered as regular equipment on Graver Reactivator high-rate, solids-contact

clarifiers and softeners, and Rota-Rake Clarifiers, horizontal flow gravity separators.

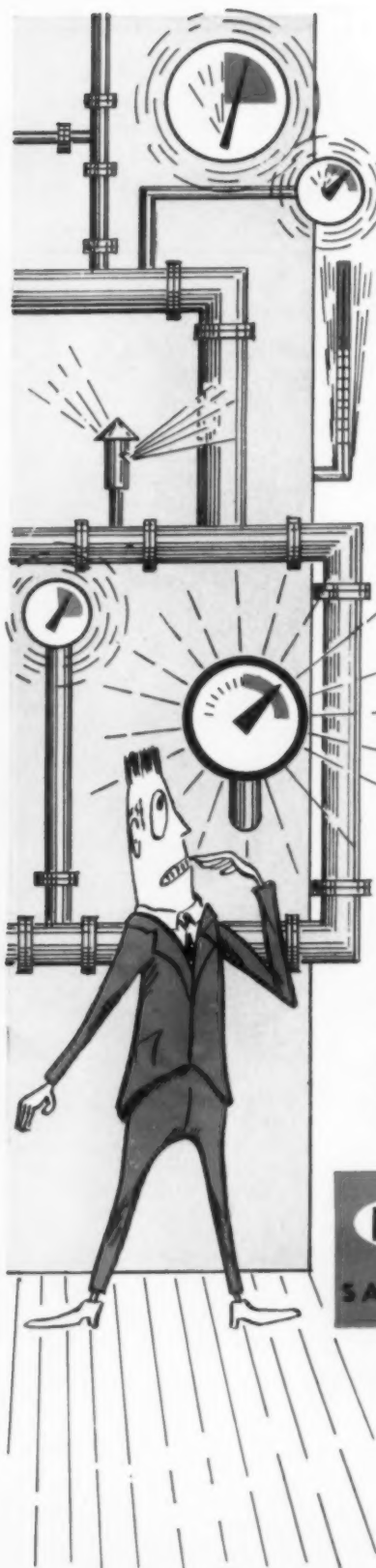


Protecta-Trol is housed in a galvanized cast iron, weather-tight assembly. It works off the input worm of the speed reducer which is spring loaded so that any increase in load above a preset point causes the worm shaft to compress the spring and allows the shaft to move. The moving shaft actuates a sensing plunger which causes movement of a pointer on a scale. The plunger, by making direct mechanical contact with the drive mechanism, produces an actual torque reading.

Plastic Coated Condulets

M-4 **Crouse-Hinds Company**, Syracuse 1, N. Y., is offering Plast-A-Coated Condulets for installation with plastic or plastic coated conduits in corrosive areas and to resist acids, alkalis, greases and oils.

(Continued on Page 58)



WATER TREATMENT PROBLEMS?

**BETTER
SEE DEADY !**

WHATEVER YOUR PROBLEM, CONSULTING WITH DEADY WILL SAVE YOU TIME, CONFUSION AND COST. YOU CAN WORK WITH ONE SINGLE SOURCE FOR:

COMPLETE PLANT SURVEY
of water-treating equipment

LABORATORY ANALYSES
of your water supply

RECOMMENDATIONS
for proper water-treatment

PRODUCTS
for most effective water-treatment

"CHECK-UP" SERVICE
to insure protective maintenance

FOR THE NAME OF THE SERVICE ENGINEER NEAR YOU WHO OFFERS THIS COMPLETE SOLUTION, WRITE:



CHEMICAL COMPANY

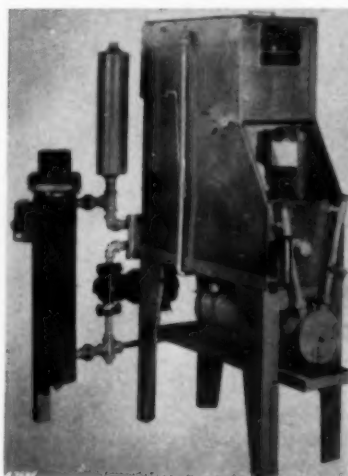
1401 Fairfax Trafficway
Kansas City 15, Kansas

(Continued from Page 57)

The black plastic coating is a tough material which adheres to the conduit surface and has good resistance to abrasion. With coated products of this kind, the company offers a complete plastic covered, metallic installation without losing the protection of ground continuity or impairing the safety of explosion-proof apparatus. Touch-up compound is available to cover exposed areas in threads and cover joints, thereby providing a seal against the corrosive agent.

Frost Concentrator

Niagara Blower Company,
M-5 405 Lexington Ave., New
York 17, N. Y., announces
new automatic apparatus for preventing frost accumulation on the refrigerated coils of large-scale



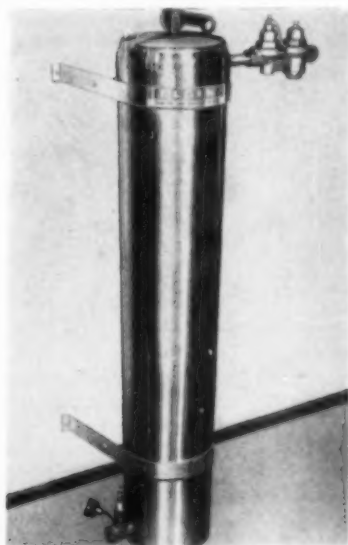
commercial freezing and cold storage installations, with convenient disposal of the condensed moisture.

A non-freezing, hygroscopic liquid is sprayed over the cold coils of a fan cooler, absorbing the moisture as fast as the coils condense it. As this condensate water dilutes the absorbent solution to the point where freezing becomes possible, its strength is restored by the "No-Frost" concentrator. This new concentrator adapts a submerged electric water heater to provide sufficient heat to evaporate the water while the reconcentrated liquid is returned to its frost prevention duty.

Junior Deionizer

M-6

A compact new deionizer called the Junior 120 because it delivers up to 120 gallons of deionized water per hour is being manufactured by **Elgin Softener Corporation** of Elgin, Illinois. Included with the unit is a



service whereby removable bags of mixed ion exchange resin, when exhausted, are simply lifted out and exchanged for factory regenerated refills. It delivers between 6300 and 8400 grains exchange or up to 1,500 gallons per cycle.

When effluent resistance falls below 50,000 ohms (the measure of commercially distilled water), a built-in ohm meter actuates a pilot signal. Spent material is then replaced with fresh ion exchange resin which the user keeps on hand. The spent material is returned to the manufacturer in furnished containers. Elgin then promptly regenerates it and returns fresh material to the user.

Outdoor Cooling Tower

M-7

A new outdoor type cooling tower has been announced by **Acme Industries, Inc.**, 600 N. Mechanic St., Jackson, Michigan. Floor area and overall space requirements have been reduced by as much as 50%; weight has been reduced a com-

parable amount. Rotting and fungus growth have been eliminated. Because of its unique design, the new Econ-O-Mizer Cooling Tower can be disassembled and reassembled quickly and easily on the site and the plastic deck can be removed for cleaning and maintenance in a matter of minutes.

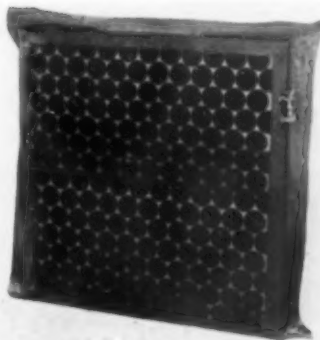
The deck consists of a series of high-impact polystyrene drip trays which are fastened into easy-to-handle building blocks. These "building blocks" are simply stacked in the housing. Since the plastic deck cannot warp, the drip pattern remains constant for the life of the tower and capacity will not vary over a period of time.

All models are equipped for automatic make-up water control valve, overflow, drain, pump suction fittings and debris screens. A specially engineered anti-vortex chamber insures positive pump priming and prevents cavitation.

Odor Filter

M-8

American Air Filter Co., Inc., Louisville 8, Ky., has introduced a new disposable activated carbon odor filter. Representing a new concept in odor filter design, it combines high-



efficiency odor removal with a high degree of air cleaning in one low-cost, disposable-type unit.

Activated carbon adsorption is a positive, practical method for the control of odors and other unwanted gases. It can be used in almost any situation where contaminants in vapor form should be removed from an enclosed space. The new filter requires no reactivation.

The carbon fibers are produced around a synthetic core which incorporates an adsorbing surface with

a strong filament body. The fibers are long and curled so as to produce a resilient pad of uniform density which completely fills the cell sides. All of the air must pass through the carbon filaments and the fiber structure results in a maximum amount of surface exposed to the air stream. These odor filters are offered in four standard sizes to fit conveniently in standard 2 inch frames.

Power Centers

M-9

A new line of indoor unit substations has been introduced by **Federal Pacific Electric Co.**, 50 Paris St., Newark 1, N. J. Rated up to 500 kva, the units are designed to transform and



control power at primary voltages of 5 or 15 kv to secondary distribution voltages at the point of use. Each power center consists of a unit enclosure incorporating primary switch, transformer, and secondary distribution sections.

Chief advantages of the package power center are its compact size, operator safety, and front access to all operating parts. The maximum overall dimensions are 78" high, 98" long, and 42" deep.

Primary sections are available with 5 and 15 kv fused and non-fused load break switches, or with 5 and 7.2 kv fused and non-fused oil cutouts. Transformer sections, suitable for operation on these primary systems, are available in a wide range of sizes.

Secondary sections have base assemblies engineered on modular dimensions, and pre-drilled mounting rails and bus bars that offer flexibility in accommodating any of the four basic types of components.

Only \$2⁷¹ a square foot
for this **DIXISTEEL** building



This DIXISTEEL Multiple Rigid Frame Building has 41,800 square feet of clear span working area. The complete cost, including sprinkler system, was only \$2.71 a square foot.



\$3.75 a sq. ft. for this 40 x 60 DIXISTEEL Building, including air conditioning.



\$3.87 a sq. ft. for this 100 x 120 DIXISTEEL Lo-Line which makes an ideal clear-span bowling alley.



\$3.32 a sq. ft. for this 7,000 sq. ft. DIXISTEEL Building, including air conditioning and all fixtures.

Beautiful DIXISTEEL Buildings offer the easiest, quickest, most economical way to have a modern structure for any type of business . . . from small work shops to large manufacturing plants.

DIXISTEEL Buildings are available in two complete lines: Standard, with a 4/12 roof slope, and the new Lo-Line with a 1½/12 roof slope.



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PRODUCTS

Steel Building Division

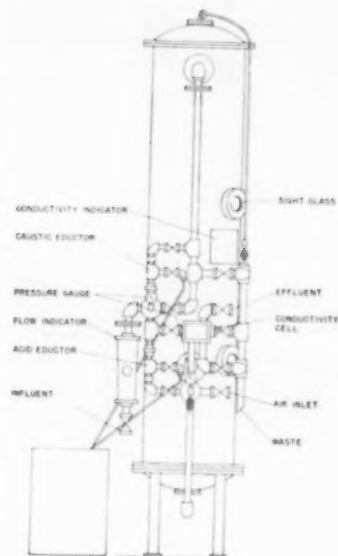
Atlantic Steel Company

P.O. Box 1714, Atlanta 1, Georgia • TRinity 5-3441

New Products (Contd.)

Packaged Demineralizer

M-10 A new packaged demineralizer designed for quick installation has been developed by **Cochrane Corporation**, Philadelphia, Pa. On-site erection consists of setting the unit in place



and connecting to air and raw water supply, treated water outlet, and open drain. Only electrical connection required is for a conductivity controller, which uses 110 v 60 cycle current.

Designated as the Uni-Pac "M" series, models of the new demineralizer are available in capacities from 2100 to 13,200 gph using raw water with 10 grains per gallon total exchangeable anions.

Operating valves and piping are corrosion-proof PVC and exchange tanks are lined with the same material. Auxiliary polyethylene regenerant tanks are provided for acid and alkali. Units are equipped with conductivity and rate-of-flow indicators. Optional controls include totalizing water meter, audible alarm, and automatic cut-off valve to stop flow at end of service cycle.

For More Free Data FILL IN CODE NO.
on the Handy Return Card — Page 67

Valve Test Bench

M-11 A new valve test bench designed for pressure testing of all types of valves found in refineries, chemical, petrochemical and power plants has been placed on the market by **Piping Engineering Company**, Tulsa, Oklahoma.



The bench has two test plates: one for 1/2" through 2" screwed valves and 8" through 10" flanged valves, and one for 2 1/2" through 6" flanged valves. Separate controls and gauges are available so that two different valves may be tested at the same time. Special adapters are furnished with each unit for quick change-over from one size and type of valve to another.

Valves may be tested with either gas or liquid within a pressure range of 0 to 1000 psi on the standard valve test bench. Units are also available for higher pressures.

Dispersing Agents

M-12 **Wyandotte Chemicals Corp.**, Wyandotte, Mich., has introduced Pluronics, a new series of 100% active nonionic surface active agents for use in boiler water treating compounds and other phases of water treatment. Properties of the Pluronics of primary interest in water treating applications are their low foaming characteristics and effective dispersing power.

Pluronic F68 and Pluronic L64 are exceptionally effective dispersing agents for calcium and magnesium salts. The Pluronics, by keeping these inorganic salts in solution, reduce the amount of adherent hard water deposits in boilers and pipes. The use of the Pluronics also renders the scale that does precipitate softer and more easily removed due to their rewetting effect.



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Tool Steels	Corrosion
Arc Welding	Principles of Machining
Blast Furnace Operations	Fundamentals of Welding and Joining
Metals for Nuclear Power	Principles of Heat Treating
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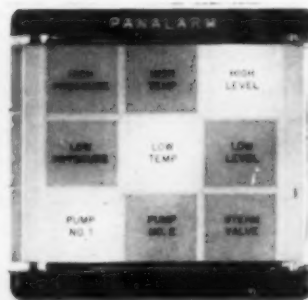
BIRD-ARCHER WATER TREATING CONSULTANTS

The BIRD-ARCHER Company, 4337 N. American St., Phila. 40, Pa.
New York • Chicago

New Products (Contd.)

Miniature Annunciator

An economical, miniature, "lo-drain," expandable annunciator to provide information and control of industrial process systems has been developed



by Panellit, Inc., 7401 No. Hamlin Avenue, Skokie, Illinois.

The "Panastat" annunciator has longer life and greatly decreased maintenance because there are no moving parts. All operational functions are performed by solid state elements. Low energy control circuits (a tiny fraction of 1500 millijoules) and negligible inductance (considerably below .001 Henry) provide intrinsic safety. Ignition in hazardous atmospheres is impossible because no arc can be sustained.

Multiple Diaphragm Valves

Allis-Chalmers Mfg. Co., Milwaukee 1, Wis., is now offering an automatic multiple valve arrangement for control of water treatment systems. Individual, hydraulically operated diaphragm valves are used to control the various operations of filters, hot and cold water softeners, dealkalizers, hydrogen zeolite softeners, and deionizers.

The diaphragm valves are opened or closed by sequencing of a manual or automatic pilot valve. The pilot valve indicates the complete operating cycle and provides exact duplication of sequencing. A manual pilot valve is positioned by turning a dial knob, providing quick finger-tip operation of the valves on the

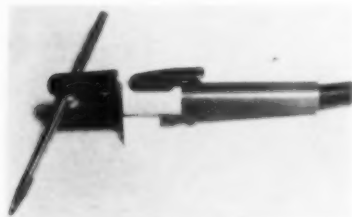
water treating unit. When completely automatic operation is required, a cycle timer is employed to position the pilot valve.

To backwash a filter bed, or to regenerate an ion exchange unit, the pilot valve is moved to the No. 1 position. In this position all valves are closed by "power" water being directed through the pilot valve to the top of the valves. Clockwise rotation of the pilot valve to the following positions opens the proper valves to perform the cycle of backwash, regenerant introduction and rinse.

Automatic systems with cycle timers are initiated either by a pushbutton at the cycle timer box, an attached electric time clock, or by an electric contact register mounted on the water meter. The adjustable electric cycle timer returns the unit to service upon completion of the previously timed functions and can incorporate switches to operate pump motors, alarms and indicating lights.

Heavy Duty Torch

M-15 Arcair Company, Box 431, Lancaster, Ohio, is now making the H-55 torch, a heavy duty model for industries whose work requires air on both

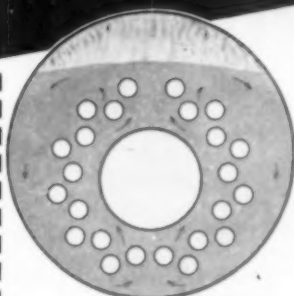


sides of the electrode. Primary applications are in foundries for flash removal and cutting holes on similar jobs which require frequent reversal of travel direction.

An outstanding improvement on this model is the pushbutton air control valve in the torch handle. Either $\frac{1}{8}$ " or $\frac{3}{16}$ " diameter electrodes can be used. It is heavily insulated to guarantee long maintenance free service.

(Continued on Page 64)

rapid, natural water circulation



2-PASS DESIGN...

Continental AUTOMATIC BOILERS

One of the important advantages of the Continental 2-Pass design is the large diameter combustion tube providing maximum heat release volume, surrounded by concentric location of tubes in the water circulation path to eliminate accumulation of any insulating gas pockets. Large clearances are provided between tubes and combustion chambers as well as between tubes and outer shell. This assures unimpeded rapid water circulation down around the shell and up around the furnace.

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New Products (Contd.)

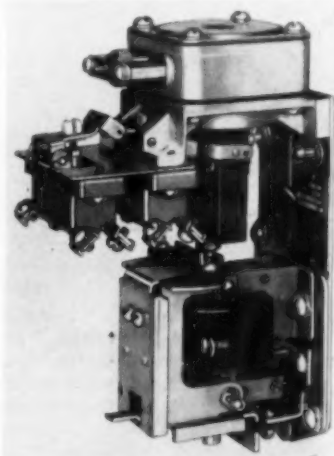
Flow Tubes

M-16 B-I-F Industries, Inc., Providence, R. I., recently announced the expansion of their line of insert-type plastic Builders - Providence Dall Flow Tubes for primary flow metering to handle line sizes up to and including 48 inches. It is especially adaptable to industrial and chemical uses, to process industries, water and sewage — wherever acids, alkalies, slurries and gases require accurate metering.

The Model DFT-PI, Plastic Insert Dall Flow Tube is made of fiberglass-reinforced epoxy or polyester resins with metallic throat lining. It is available in a variety of sizes and flange and throat materials. Design features include self-contained instrument taps, low head loss, low weight, high accuracy (within 1% of actual flow rate), maximum corrosion resistance, and lower cost.

Timing Relay

M-17 An adjustable-range pneumatic timing relay with two normally open and two normally closed timed contacts is now available from **Square D**



Company, 4041 North Richards Street, Milwaukee 12, Wisconsin. Two single-pole, double-throw snap switches are used for the timing contacts, and each can be separately adjusted to provide a definite timing

sequence. Thus, one snap switch can be set to operate before the other.

Up to two instantaneous single-pole double-throw interlocks can be furnished. Timing range is adjustable from .2 seconds to 3 minutes, with a repeat accuracy of $\pm 10\%$. The new timing relay is available for either a-c or d-c operation.

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Hydraulic Operated Maintenance Sets

M-18 Three new industrial hydraulic maintenance sets are available from **Owatonna Tool Company**, 397 Cedar St., Owatonna, Minnesota.



The most popular set for small and medium equipment contains a 17½ ton ram, pump, pullers and appropriate attachments. The 30 ton capacity set offers all the 17½ ton components, plus a 30 ton ram and appropriate 30 ton attachments. The 50 ton capacity set can handle 99 per cent of all pulling jobs. It incorporates all of the 17½ and 30 ton components, plus its own 50 ton ram, special pump and appropriate attachments.



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NEW Catalogs & Bulletins

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MAINTENANCE—TOOLS EQUIPMENT & METHODS

2—Electrical Maintenance — New contract service (for Southeast only) inspects and tests motors, generators, gearing, control and distribution systems, etc., at a cost less than 1% of value of equipment. — Atlanta office of WESTINGHOUSE ELECTRIC.

4—Spotcheck — You can save time, money and labor in finding cracked parts quickly and easily with this \$36.00 Spotcheck Kit — a dye penetrant inspection technique. Bulletin describes complete fire-safe materials and kit. — MAGNA-FLUX CORP.

8—Tool Truck — Save time with this compact truck carrying full tool selection to emergency repair jobs. Four drawer unit described in literature 8141-A. Semi-pneumatic 10" balloon tires ease heavy loads over rough pavements. — SNAP-ON TOOLS CORPORATION.

15—Stress Relieving — Data sheets describe medium frequency (1200 to 12,000 cycles) induction heating equipment for stress relieving of weldments and shrink fitting. Mobile power converters and special cable. — BROWN-BOVERI.

17—Mechanical Packings — 32 p Cat. PC-103 describes a variety of packings and gaskets, including self-lubricating, sheet and molded packings, etc. Includes application charts and price information. — GREENE, TWEED & CO.

18—Maintenance Ideas — 4-page folder highlights 90 ways Kano Kroil and other products can help the man-in-the-plant. — KANO LABORATORIES.

22—Lubricator Alert — Data sheet describes lubricator flow switch that indicates positive flow at terminal points on any force feed lubricator system. Easily installed on any existing application. Indicates lack of flow to the point of injection. — MANZEL.

29—Belting Repairs — Two bulletins "How to Properly Join Belts" and "Belt Fastener Selection Chart"

offer service help on conveyor, elevator and transmission belting. — CRESCENT BELT FASTENER CO.

31 — Stack Maintenance — How wrought iron offers unique defense against flue gas corrosion described in bulletin "Wrought Iron for Flue Gas Conductors." — A. M. BYERS COMPANY.

32—Scale Removal — Data sheet on Kwik-Kleen, a completely safe method of rapid scale removal for heat transfer surfaces. — THE NORTH AMERICAN MOGUL PRODUCTS COMPANY.

38—Heavy-Duty Wrench Set — Literature 8141-C details the Loxocket 521-EHD-B. Metal case containing 17 sockets from 1 7/16" to 3 1/4", ratchet, sliding bar and two extensions — 8" and 16" — ready to go on any assignment. — SNAP-ON TOOLS CORPORATION.

78—Control Heat and Glare — New folder tells how Sun-X Glass Tinting (transparent alkyd-based liquid plastic by duPont) is applied directly to existing glass by flow process without spray or splatter. Bonds tightly. Wash in usual manner. — AMERICAN GLASS TINTING CORP.

96—Tube Cleaners — Mechanical units for boilers, condensers, evaporators and pipes described in Catalog 77A. Over 100 pages of air motors, cutting heads, drills, etc. — THOMAS C. WILSON, INC.

FANS—PUMPS—COMPRESSORS HEATERS—HEAT EXCHANGERS

107—Proportioning Pumps—4 p brochure illustrates and describes company's proportioning pumps and package chemical feeding units. Includes applications and specifications. — BIRD ARCHER CO.

120—Continuous Blow - Off Equipment — Publication No. 5700 shows how equipment can effect substantial savings in heat and fuel by returning the heat contained in the blow-off. System also maintains uniform dissolved solids concentration in boiler. Typical applications and lists of users are included. — COCHRANE CORPORATION.

122—Industrial Fans — Bulletin 702 covers Type XL fans for air and material handling. Volumes to 130,000 cfm pressures to 18" SP. Catalog 855 describes Pressure Fans. Volumes to 12,000 cfm, 10" to 50" SP. — CLARAGE FAN CO.

135—Heat Exchanger — Bulletin 132 shows how sectional Aero unit gives close temperature control, saves labor, power, and water; design improves heat transfer to outdoor air by evaporation; 7,000,000 to 18,000,000 Btu/hr capacity range. — NIAGARA BLOWER COMPANY.

143—Chemical Feeders — 36 p Bul. 1136 describes metering pumps — types, construction, displacement and operating pressures. Gives handling recommendations for chemicals, acids, etc., and volumetric conversion tables. — MANZEL.

160—Boiler Feed Pumps—12 p Bulletin 122 describes and illustrates the type BFI high pressure pumps. Design features, service ratings and engineering data included. — PACIFIC PUMPS, INC.

169—Airfoil Fans — Bulletin No. 179 covers complete line of Airfoil mechanical draft fans for forced and induced draft featuring wide range of pressure-volume ratios, high efficiency, low noise level, rugged construction. — GREEN FUEL ECONOMIZER CO.

INSTRUMENTS—METERS CONTROLS—REGULATORS

201—Valves & Gages—Handy guide No. 36 gives data and prices on valves, liquid-level gages and accessories for process and power industries. — PENBERTHY MFG. CO.

212—Self-Powered Controls — Bulletin 620 describes self-powered automatic temperature regulators — no compressed air or electrical wiring required, no delicate mechanisms to adjust, no packing glands to stick, no shut-down due to power failure. — SARCO COMPANY, INC.

206—Process "Indicator" — Catl. 100 B shows how you can have maximum info on all process variables with Panalarm annunciators. Trouble anywhere is signalled instantly — before it can grow big and expensive. — PANELLIT, INC.

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Bulletins (Cont.)

PLANT CONSTRUCTION—WELDING EQUIPMENT—SPECIALTIES

PIPING—VALVES—FITTINGS STEAM SPECIALTIES—TRAPS

221—Boiler Water Level Controls—Catalog describes exclusive magnetic operating principle. Low water cut-offs (single stage); pump controls; low and high water alarms; and water columns. Complete line 0-900 lb wsp. — MAGNETROL INC.

222—Pressure Regulators — Catalog No. 77 illustrates and describes application, operation and specifications for a complete line of reducing, back-pressure and pump-pressure regulators. — MASON-NEILAN.

223—Combustion Control — Bulletin 1023, 24 pages—Contains actual installation photos and diagrammatics of Bailey air operated combustion control for oil and gas fired boilers; two pages of chart records and six page list of typical installations. — BAILEY METER COMPANY.

234—Soot Blowing Control Systems — 16 p Bulletin 1029 covers line of systems. Gives complete engineering description and illustrations of Selective-Sequence and Automatic - Sequential insert - type panel controllers. List of typical installations show a wide variety of applications. — COPES - VULCAN DIVISION.

235—Liquid Levels — Bulletin 532 describes indicator which gives a reliable, automatic reading of storage tank contents. 20" dial in 3 x 10" case saves panel space. No outside power source needed; can be located up to 250 ft from tank. — THE LIQUIDOMETER CORP.

267—Remote Liquid Level Indicator — How clear, brilliant readings from any angle are possible with this unit is explained in Bulletin WG-1824. Pointer is always visible, even at extreme high and low water levels. Of manometric type with automatic temperature compensation. — YARNALL-WARING COMPANY.

281—Control Valve — 8 p Bul. J-170 describes sliding gate and plate control valves available. Includes engineering data, cutaway drawings, features, application information, dimensional drawings, flow capacities, rating charts, flow curve and sample specifications. — OPW-JORDAN.

299—Boiler Control Systems—GPS-901 describes power, steel, marine and industrial boiler control systems and components. Also temperature and process control systems. Water treatment chemicals, boiler compounds and inhibitors for industrial and municipal purposes. — HAGAN CHEMICALS & CONTROLS, INC.

301—Vacuum Cleaning Systems — How portable and stationary systems cut costs and increase plant efficiency shown in Booklet P8 and AB-100. Eight heavy duty units (1½ to 15 hp) for cleaning hard to get at areas, reclaiming valuable materials, etc. — U. S. HOFFMAN MACH. CORP.

319—Portable Band Saw — Bulletin describes the Kalamobile, a portable metal-cutting band saw. Has rubber-tired 12" wheels and telescoping handles. Capacity 6" rounds - 10" flat. — Machine Tool Div., KALAMAZOO TANK AND SILO CO.

322—Heat Transfer Cements—Engineering Data Book 502 includes calculations, estimating and installation procedures on properties and uses of Thermon heat transfer cements. Contains complete list of Southern engineering representatives. — THERMON MANUFACTURING COMPANY.

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See Pages 67 & 68

323—Mercury Vapor Fixture — Industrial color corrected units described in Bulletin 401. "Stabilux Socket" secures bulb end of lamp, eliminating lamp rupture and breakage from vibration. — WIDE-LITE CORP.

324—Painting New Plants — "Plan Painting of New Plants to Reduce Costs" describes how company's lead-suboxide paints can save 1 or 2 coats of paint on new plants. Eventual repainting costs are cut as well since these paints form a dense, metallic lead film which can be recoated without expensive scraping, sanding or repriming. — SUBOX INC.

347—Chemical Feeders — 34 p Catalog 1136 helps you select the exact metering pumps needed to meet any requirements. — MANZEL.

386—Rigid Frame Buildings—8 page bulletin "Dixisteel Rigid Frame Buildings" — low cost, flexibility of design, durability, and minimum maintenance; also triangular or bow-string truss all-steel roof systems; fabricated for rapid erection. — ATLANTIC STEEL COMPANY.

401—Steam Traps — Bulletin 775 gives price, dimension and capacity data on Open Float and Thermostatic Steam Traps for trouble-free heating service. — ARMSTRONG MACHINE WORKS.

405—Temperature Problems — 4p folder "Service for Efficient Thermal Conservation" covers insulation solutions for high and intermediate temperatures, heating and air conditioning-low pressure steam, and ice water and frigid temperatures. — MUNDET CORK CORPORATION.

403—Valve Operators—Folder shows how re-designed sprocket rim makes any valve readily accessible from the floor. Simplifies pipe layouts, prevents accidents, fits all valve wheels. — BABBITT STEAM SPECIALTY CO.

407—Piping Materials—Bulletin reports on intensive investigation into problem of main steam piping materials and gives data on stress rupture characteristics of Types 316 and 347 stainless steel piping adjacent to welded joints. — PITTSBURGH PIPING AND EQUIPMENT COMPANY.

408—Wide-Range Valves — Data Sheet 10-5 covers the "Point 4 Factor Trim" — answer to those few types of applications where reduced capacity trim is desirable. Available in V-port and solid turned designs for double or single seated valves and in wide variety of material. — MASON-NEILAN DIV.

432—Aluminum Jacketing — Data sheets describe low first-cost, long life jacketing for weatherproofing of insulated lines, towers, vessels and tanks. Lap-Seal design feature makes more positive weather seal. — CHILDERS MANUFACTURING COMPANY.

465—Water Hammer — Cause, effect and control covered in Bulletin 851. — THE WILLIAMS GAUGE CO., INC.

466—Pipe Insulation — Folder describes Superglas with "hinged action" — mfg. in one-piece, full length sections open easily to speed installation; easy cutting and fitting; temperature limit is 350 F. — MUNDET CORK CORPORATION.

468—Steam Traps — 40 p engineering manual aids engineers and maintenance men in sizing, specifying and buying of steam traps and other fluid specialties. All data necessary to engineer a trap installation is included. — V. D. ANDERSON CO.

Bulletins (Cont.)

BOILERS—STOKERS TURBINES—BURNERS

500—Underfeed Stoker — Type "R" multiple retort underfeed stoker in sizes from 20,000 to 500,000 lb of steam per hour; air and water-cooled types available; burns both low and high grade coals, wet or dry; either continuous ash discharge or power dump, with moving ash discharge plates. — AMERICAN ENGINEERING CO.

506—Package Boilers — Practical construction with Continental two pass design described in Bulletin BE100. Units range in size from 20 to 600 hp; 15 to 250 pressures burning oil, gas or combination. — BOILER ENGINEERING & SUPPLY.

509—Free Coal Counseling — General information on how Coal Bureau engineers will advise on selection, transportation and utilization of the right coal for your purpose. — NORFOLK AND WESTERN RAILWAY.

521—Gas Tempering — How you can burn the most economical fuel available (coal, oil or gas) described in Bul. G-96. Cuts overall plant costs since smaller size unit requires smaller building per kw, etc. — THE BABCOCK & WILCOX CO.

530—Coal Plant Specifications — 64 page brochure, including 5 drawings, is a comprehensive guide for preparing specifications on coal-fired, low-pressure heating plants in the size range of 750,000 to 5,500,000 Btu/hr. All aspects affected by choice of fuels from storage bin to stack design covered fully. — BITUMINOUS COAL INSTITUTE.

532—Economical Steam — Forced draft, pressurized gas or oil fired units described in SB-59 catalog. Two-drum water tube units include steam trim, draft equipment, burner and combustion safety controls. — ERIE CITY IRON WORKS.

534—Package Generator — Model AA generator has new low pressure air atomizing oil burner, which cleanly and uniformly burns all commercial grades of oil (No. 4 with little or no preheat) for more efficient, economical firing. Many other new features. — AMES IRON WORKS, INC.

539—Industrial Burners — How to keep heating costs low with Hev-E-Oil commercial-industrial burners described in literature SPI-859. Models from 5 to 150 gph; automatic, electronic controls; Hev-

E-Duty power gas burners and combination gas/oil burners from 720,000 to 21,000,000 Btu. — INDUSTRIAL COMBUSTION, INC.

557—Coal — Current brochure on "Prescription Coals." — A. T. MASSEY COAL CO., INC.

565—Self-Contained Boilers — 8 p brochure AD-162 describes company's line of Model CB boilers. Highlights design features, fuel flexibility, four-pass, forced draft design, unified electric and steam preheater, quiet vibrationless impeller, and hinged doors with built-in refractory. — CLEAVER-BROOKS CO.

566—Packaged Combustion Unit — Completely piped, wired and tested factory assembly described in Bulletin B8/30. Has Kinetic gas burner, manual firing valve, automatic diaphragm gas valve and electronic combustion safeguard system incorporating RA680 cabinet. Available in 3 sizes with 8 capacities from 800,000 to 3,260,000 Btu/hr. — WEBSTER ENGINEERING CO.

572—Coal-Pak Automatic Boiler — Cat. AIA No. 30-A, 34A gives typical applications of Coal-Pak automatic boiler — low-pressure steam heating, hot water heating, and high-pressure process steam. — BITUMINOUS COAL INSTITUTE.

ENGINES—DRIVES POWER TRANSMISSION MATERIAL HANDLING

601—Crane Runway Rails — Catalog gives information on crane rails, angle bars, crane stops, rail clips, hook and anchor bolts, bearing plates. Also specifications on various sizes of crane rail clips and explains how to order rails. — L. B. FOSTER CO.

606—Retaining Ring Kits — 400 Truarc cadmium plated rings — 84 sizes in one economy kit. Sizes from ¼ to 2½ in. in three most used series of internal, external and universal crescent ring designs — \$34.50 per kit. — DIXIE BEARINGS, INC.

612—Hydraulic Ash Conveyors — Bulletin S57 describes how to cut costs but maintains high operating efficiency with hydraulic ash conveyors. — NATIONAL CONVEYORS CO. INC.

614—Vertical Transportation — Elevator Catalog — Describes and illustrates details of passenger and freight elevators, escalators, dumbwaiters, and modernization and maintenance equipment for use in industrial, utility and service plants. — OTIS ELEVATOR CO.

618—Casters & Wheels — Featuring "Lockweld" steel casters without a king-pin, Cat. C-57 describes full line of industrial wheels manufactured and distributed from Rome, Ga. plant. — THE FAIRBANKS CO.

623—Overhead Handling Equipment — 8 page catalog pictures and describes overhead handling equipment. Includes all basic standard equipment used in 90% of all Monorail installations. — THE AMERICAN MONORAIL CO.

642—Sectl. Belt Conveyor — Bulletin 458 describes pre-engineered units — exploded views with all quality components called-out. — STEPHENS-ADAMSON MFG. CO.

650—Vibrating Feeders & Conveyors — 96 p book covers company line of electric vibrating feeders and conveyors. Includes controls, installation methods, principles of operation and individual unit specifications. — JEFFREY MANUFACTURING CO.

657—Bin Level Switches — Bulletin 159 on "Tellevel" describes normal duty explosion proof and heavy duty units. — STEPHENS-ADAMSON MFG. CO.

WATER TREATMENT

Technical Reference Guide
and Buyer's Directory for the
South-Southwest.

See Pages 36-38

ELECTRICAL

801—Motors — Bulletin describes and catalogs more popular a-c motors from 1 to 600 hp, for every process and manufacturing requirement. Single phase and polyphase; surpass NEMA specifications. — BROOK MOTOR COMPANY.

802—Control Relay — Convertible contact Type BR described in Bulletin 700 as ideal for use on machines where control functions are frequently altered. Contacts can be arranged for either normally open or normally closed operation. Changeover can be made in seconds. — ALLEN-BRADLEY.

813—600-Volt Wiring — How Anaconda Densheath 900 offers long life, high heat and moisture resistance, chemical stability and easy installation is described in Bulletin DM-5612 — ANACONDA WIRE & CABLE CORP.

816—High Voltage Protection — 36 p catalog of linemen's protective equipment describes products for utility and industrial electrical fields. — CHARLESTON RUBBER COMPANY.

820—Electrical Maintenance — New contract service (for Southeast only) inspects and tests motors, generators, gearing, control and distribution systems, etc., at a cost less than 1% of value of equipment. — Atlanta office of WESTINGHOUSE ELECTRIC.

842—Circuit Protection — Bulletin FIS describes the maintenance free Fusetron fuses which protect motors, solenoids, coils and transformers against burnout, and which increase production by eliminating needless blows.—BUSSMANN MFG. CO.

855—Wiring Analyzer — 4 page bulletin describes Model 301 Adequate Wiring Analyzer which quickly, simply and easily tests wiring without confusing calculators or slide rules.—SPRAGUE ELECTRIC COMPANY.

862—Motor Starters — Manual, auto-transformer type recommended where characteristics of driven load or power company rules require reduced voltage starting. Details in Bulletin 646. — ALLEN-BRADLEY.

874—High Voltage Rubber Cables— 32 p catalog contains information on design features, insulations available, and performance highlights of company's butyl rubber power cable, Durasheath. Also data on kinds of available constructions from 600 v to 15,000 v conductors. — ANACONDA WIRE & CABLE CO.

900—In-Plant Training — Brochure tells how you and your plant can benefit from home study courses — Arc and Oxy-Acetylene Welding, Stainless Steels, Corrosion, Tool Steels, Heat Treating, Metals for Nuclear Power. Beginning and advanced plant-tested courses available in 23 fields. — METALS ENGINEERING INSTITUTE of ASM.

For More Free Data **FILL IN CODE NO.** on the Handy Return Card — Page 67



Around-the-clock operations at the Champion Paper and Fibre Company's sprawling Pasadena, Texas, plant called for illumination of a million square feet of wood storage area. And just thirty-two 1,000-watt Wide-Lite area lights were required to provide the answer—uniform coverage without distracting glare or dangerous dark areas.

Designed especially to enhance the unique characteristics of color-corrected mercury vapor lamps, Wide-Lites bring *new dimension* to area lighting. They produce broad patterns which provide smooth, even coverage without hot spots or dark shadows. The patterns may be accurately plotted to determine the exact number of units needed to provide any desired level of illumination.

Ruggedly constructed from cast aluminum alloy, Wide-Lites are finished in aluminum epoxy paint for corrosion control. Outdoor models are sealed with tempered glass lens, and re-lamping is accomplished without disturbing the seal of the lens. Exclusive built-in heat radiating fins limit lamp temperatures to the most efficient range. A choice of reflectors is available on all models, and sizes range from 100 watt to 1000 watt.

To assist you in planning efficient working coverage of outdoor working areas, Wide-Lite engineers have prepared a unique group of transparent plotting curves. Write today for your set!

WIDE-LITE.

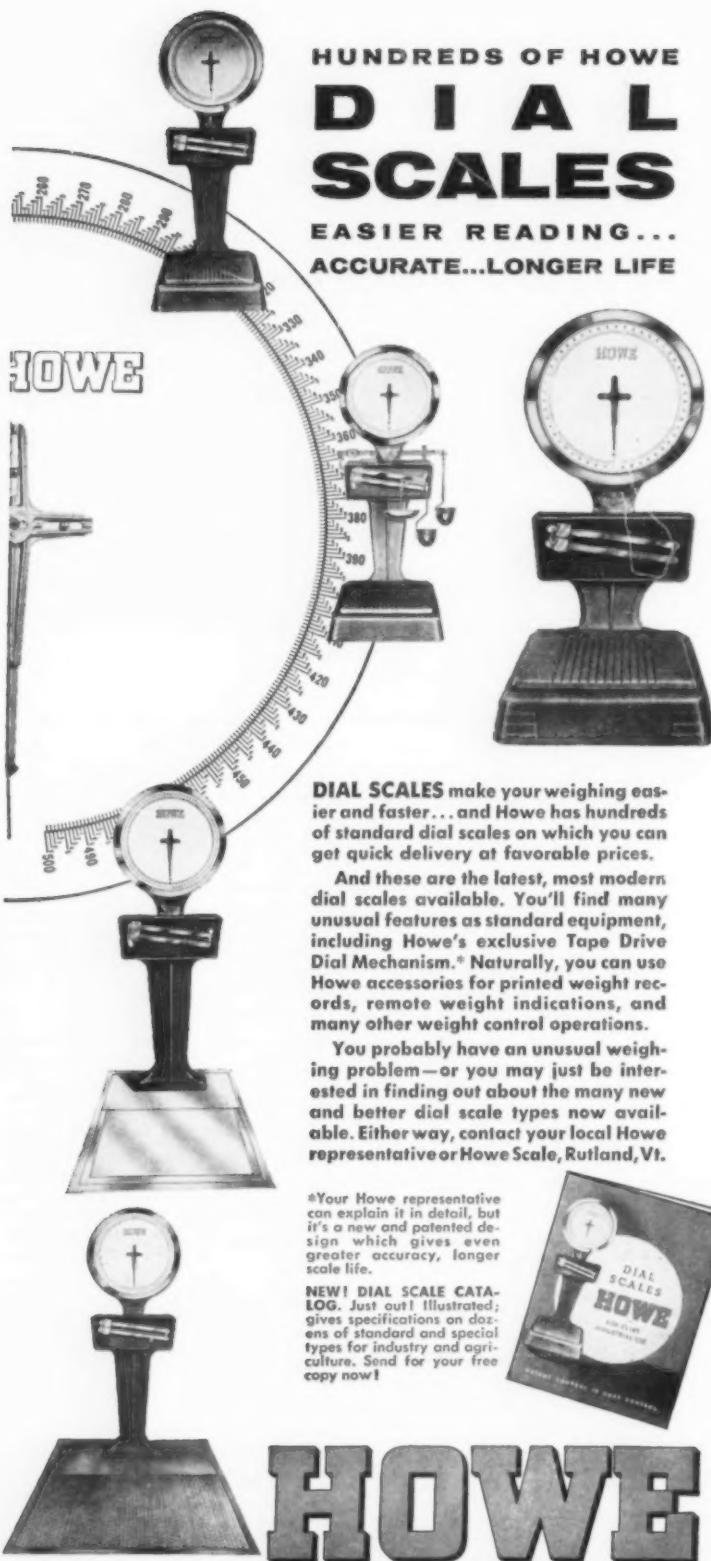
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WIDE-LITE CORPORATION

P. O. Box 191 • Houston 1, Texas

In Canada: Wide-Lite Division of Wakefield Lighted Limited
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OUTDOOR AREA LIGHTS • INDOOR LUMINAIRES • SPORTS LIGHTS • PROTECTIVE LIGHTS



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DIAL SCALES make your weighing easier and faster... and Howe has hundreds of standard dial scales on which you can get quick delivery at favorable prices.

And these are the latest, most modern dial scales available. You'll find many unusual features as standard equipment, including Howe's exclusive Tape Drive Dial Mechanism.* Naturally, you can use Howe accessories for printed weight records, remote weight indications, and many other weight control operations.

You probably have an unusual weighing problem—or you may just be interested in finding out about the many new and better dial scale types now available. Either way, contact your local Howe representative or Howe Scale, Rutland, Vt.

*Your Howe representative can explain it in detail, but it's a new and patented design which gives even greater accuracy, longer scale life.

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HOWE

THE HOWE SCALE CO. • RUTLAND, VERMONT
A SUBSIDIARY OF SAFETY INDUSTRIES, INC.

A-1—Bulk Material Handling — Catalog P-60, 4 pages, shows uses of pneumatic conveyors for ash removal in steam plants; collection, processing and reclamation of cutting oils, chips, and borings in the metal-working industry; and the handling of dry pulverized or granular materials in other industry. — **NATIONAL CONVEYORS COMPANY, INC.**, 25 Industrial Ave., Fairview, Bergen County, N. J.

A-2—Motion-Control Sheaves—Bulletin No. 8102, 8 pages, describes variable-speed sheaves with resilient cam-follower design that eliminates freezing and sticking and holds a constant driven speed under varying torque loads. Covers related equipment, selection tables, and cutaway photograph and diagram. — **T. B. WOOD'S SONS CO.**, Chambersburg, Pa.

A-3—Weighing and Proportioning — Waytrol Catalog 941, 48 pages, presents line of equipment for weighing, batching and proportioning systems. Section devoted to 6 types of constant weight feeders and data on vibrating conveyors, coolers and dryers, controls, magnetic separators, vibrating screens, tubular feeders, barrel packers and bin valves. Illustrated with photographs, drawings, and charts. — **THE JEFFREY MANUFACTURING CO.**, Columbus 16, Ohio.

A-4—Cooling Tower Drives — Bulletin No. 135-S, 8 pages, features high horsepower worm gear type-CU drives, designed specifically for cooling tower service, to quietly handle heavy-duty fans under extreme conditions of heat and humidity. Gives sizes, dimensions, horsepower ratings and other helpful information. — **THE CLEVELAND WORM & GEAR COMPANY**, 3300 East 80th St., Cleveland 4, Ohio.

A-5—Bearing Blocks and Take-ups — Book 2707, 16 pages, gives information on babbitted, bronze and plain bore bearing blocks and take-ups, including 119 new sizes added to the line. Design features and advantages, illustrations and descriptions of each type of block and take-up and its class of application are included. — **LINK-BELT COMPANY**, Dept. PR, Prudential Plaza, Chicago 1, Ill.

A-6—Cooling Towers — Bulletin No. KT-104, 4 pages, explains construction, specifications and performance details for the Kennard/Nelson cooling towers with centrifugal type fan for quiet operation. Covers fan motor, mounting

base and V-belt drive, "Z" form eliminators, wetted deck surface and one-piece welded sump pan. — AMERICAN AIR FILTER CO., INC., Dept. PD, 215 Central Ave., Louisville 8, Ky.

A-7—Butterfly Valves — Bulletin 10KN — Loose-leaf pages cover Monoflange Mark II rubber seat butterfly valves, giving complete specifications, dimension drawings, water flow data, gas flow data, weights and prices. — HENRY PRATT COMPANY, 319 W. Van Buren St., Chicago 7, Ill.

KEEP UP-TO-DATE USE SPI READER SERVICE

See Pages 67 & 68

A-8—Gas Welding Rods — Bulletin DH-1277-B, 8 pages, gives information about gas welding rods: analysis of the rod, recommended uses, welding procedure, and physical properties. Presents data on oxy-acetylene flame, torch tip sizes, pipe welding, weights of rods and weld metal deposits, and estimating costs. — PAGE STEEL & WIRE DIVISION, AMERICAN CHAIN & CABLE CO., INC., Monessen, Pa.

A-9—Ratchet Wrenches — Catalog No. 62, 12 pages, includes a simplified method for figuring correct wrench size for any bolt or nut diameter. Shows complete line of reversible ratchet wrenches, covering the new $\frac{1}{2}$ " square drive socket sets, strap wrenches, railroad car movers and hopper car wrenches. — LOWELL WRENCH CO., Worcester 4, Mass.

A-10—Steam Traps — "The B&J Steam Trap Primer," gives fundamental facts on condensate drainage and all types of steam traps. Covers complete line of thermostatic steam traps up to 250 psig, ranging from $\frac{1}{2}$ " to 2" in bronze and semi-steel, and $\frac{1}{2}$ " to $\frac{3}{4}$ " in cast steel. Prepared especially for maintenance engineers and foremen. — BARNES & JONES, INC., "Primer," 34 Crafts St., Newtonville 60, Mass.

A-11—Hand Chain Hoists — Booklet HMA - 200, 8 pages, "Standard Specifications for Hand Chain Hoists," contains tables and recommended minimum standards on differential, worm-gear and spur-gear (or equivalent) types of hand chain hoists; hook or lug suspension and plain or geared trolley. — HOIST MANUFACTURERS ASSOCIATION, INC., One Thomas Circle, Washington 5, D. C.

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He's saving time
with a
new **Snap-on**
Tool Truck



Up a stairway on a hurry-up job, nothing to it
with the big, 10-inch diameter, semi-pneumatic balloon tires.

Emergency repair work across the plant,
compact Tool Truck carries full tool selection to the job.

Job in another building,
the Tool Truck
eases heavy loads over rough pavements or tracks. Drawers

are held shut during travel by a padlocked bar.

The new Snap-on Tool Truck is invaluable wherever tools
or parts transport is needed. Plenty of tool space with four
husky drawers.

Upper panel section is partitioned for nuts, bolts, parts.
Ample storage space
throughout.



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Tool Truck's money-saving ability.
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write us direct.

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CORPORATION
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VAPORMATIC COIL-N-SHELL

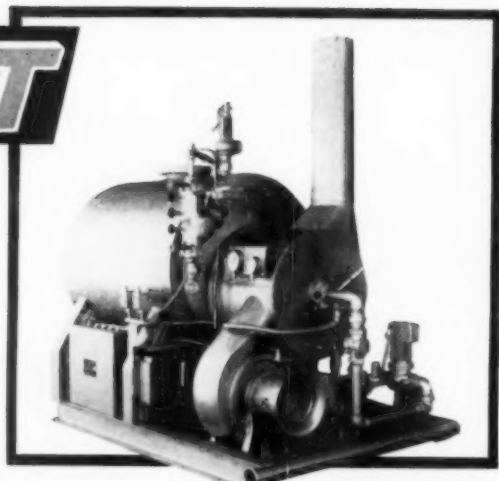
The little giant of steam generators

The advanced design and method of steam generation makes the Coil-N-Shell the most compact, efficient, and economical steam generator you can install with a steam pressure from 5 to 150 psig and a steam demand from 50 to 300 HP.

A forced circulation, water tube type generator, the Coil-N-Shell has all components unitized on a common base, requiring only a fraction of the floor space utilized by conventional boilers of comparable rating. The Coil-N-Shell generates steam from a cold start in ten minutes and is ready for high temperature operation immediately.

It is completely automatic, with modulating controls as standard equipment on all models, which are also equipped with automatic shutoff controls and safety alarm. Available with gas, oil and combination gas-oil fuel burning systems.

Complete specifications and operating data for all sizes are contained in Bulletin No. 582 CSB. Write for your copy now.



The Vapormatic Coil-N-Shell is quoted and shipped ready to fire up when feedwater, fuel, steam and electric lines are connected.



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Proven By Performance
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Southern News Briefs

(Continued from Page 21)

Nordberg — Dallas

Appointment of Donald E. Byrnes as assistant sales engineer in the Dallas Office was announced recently by Nordberg Mfg. Co., Milwaukee, Wis.

Mr. Byrnes' background includes training in diesel engineering, as



D. E. Byrnes

well as in the field on service and installation. In his new position he will assist M. R. Wall, district manager, serving users of Nordberg 2 and 4 cycle, in-line and V-type engines for municipal, industrial and pipe line applications. The Dallas territory includes the northern two-thirds of Texas, Oklahoma, and New Mexico.

Overly Mfg. Co. — Mo.

Overly Manufacturing Company has opened a new Midwestern subsidiary, Overly Manufacturing Company of Missouri, Inc., at 105 West Pacific Avenue, Webster Groves, St. Louis 19, Mo.

Howard F. Willis, president of his own metal building products sales organization in St. Louis, and Overly agent and distributor in that area since 1953, is in charge of the new subsidiary as vice-president and general manager. Plant manager is Ralph Yeskey.

The new subsidiary will produce hollow metal door frames for the Midwest market and will serve as Midwestern production and distribution center for Overly hollow metal products.

BUNTING

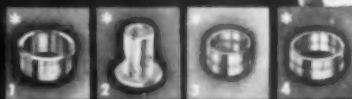
BEARING ALUMINUM BARS

have you learned what **Bunting Bearing Aluminum Bars** can do for you?

No other low priced bearing metal delivers all the many fine qualities embodied in Bunting Bearing Aluminum. Its physical properties add up to a remarkable and ideal material for most general bearing applications. Light weight is an added advantage. It machines easily and rapidly, saving labor cost. All bars are machined on all surfaces, reducing waste metal to the minimum. And it is carried in stock in 138 sizes of 13" tubular and solid bars by your local Bunting Distributor.

case in point*

Specimens of Bunting Aluminum Bearings replacing bearings of other metals which cost twice as much. No sacrifice of performance or life.



1. Cylinder gland bearing. An example of how to save money on large, thick-wall bearings. 2. A high speed 150,000 RPM - bearing for turbo super charger. Intricate machining, many dimensions, close tolerances. 3. Solid gear bearing to replace roller bearing. Bunting Bearing Aluminum is ideal where thick-wall is essential. 4. This thick-wall floating rod bearing affords an attractive economy in material cost, and an additional value in light weight.

MACHINE SHOP SERVICE . . . Small lots of special design bearings, not obtainable from stock, can be procured immediately from fully equipped machine shops through all Bunting Branches. The wide range of sizes of Bunting stock cast bronze and sintered bronze bearings makes the alteration of a stock item to a special bearing easy and economical. Bunting Cast and Sintered Bronze and Bunting Bearing Aluminum Bars provide the material for special sizes and designs which cannot be made from stock bearings. Your local Bunting Distributor can arrange for such work.

Ask for catalogs . . .

No. 158—Complete listing of sizes of Bunting Cast Bronze and Sintered Bronze Bearings and Bars, and Bunting Bearing Aluminum Bars. Pocket size edition.

No. 258—Complete listing of Cast Bronze Electric Motor Bearings for all makes and sizes of electric motors.

No. 46—Technology of Bunting Bearing Aluminum. A technical treatise on the composition, machining and use of this new bearing metal. Ask your local Bunting Distributor.

The BUNTING Brass and Bronze Company • Toledo 1, Ohio

Branches in Principal Cities

BEARINGS, BUSHINGS, BARS & SPECIAL PARTS OF CAST BRONZE, SINTERED METALS OR ALUMINUM ALLOYS

Southern News Briefs (Continued)



John R. Fuller

Acme-Hamilton — Houston

Acme - Hamilton Manufacturing Corp., Trenton, N. J., has appointed John R. Fuller, 718 Bunker Hill, Houston, Texas, as branch manager of its Houston office. Mr. Fuller has been engaged in the sales of mechanical rubber products for more than twelve years.

Swartwout Co. Sells Its Ventilator Div.

The Ventilator Division of The Swartwout Company has been purchased by a group headed by G. V. Patterson, former Swartwout vice-president. Mr. Patterson now heads the new company, **Swartwout Fabricators, Inc.**, 100 East North Street, Kokomo, Indiana.

Nalco — Texas District

Nalco Chemical Co., Chicago, manufacturer of industrial chemicals, has appointed James E. Starry manager for its Texas district, with headquarters at Houston.

Mr. Starry succeeds William H. Rodewald who recently was named vice-president and general manager of Nalco's subsidiary in Venezuela. He has been with Nalco since 1948.

Fuller Co. Expands Southern Division

An enlargement of its Southern Division to cover new markets and provide increased customer service has been announced by the **Fuller Co.**, Catasauqua, Pa.



Wm. F. Hahn

Under the management of William F. Hahn, with headquarters in Birmingham, the expanded territory includes most of Texas, Louisiana and Arkansas, with a new district office in Houston. The increased area means that Fuller Co. will be able to give closer support on its lines of pneumatic conveying equipment to Power Machinery Co., its representative with headquarters in Tulsa and branch offices in Dallas, Houston and Kansas City, Mo.

SAFE

FOR ALL INDOOR CLEANING

- ★ Dry Steam-Jet Action
- ★ Compact... Portable
- ★ Fully Approved, Economical



Flick a switch and clean *anywhere* in your plant! No flooding of work areas—high pressure, dry steam-detergent action avoids excess water on floors or equipment. Completely packaged—easily maneuvered on rubber-tired, ball bearing, swivel wheels!



Standard unit (illustrated) and Hydro Steam-Jet models described in Bulletin JC-100. Write for it. PANTEX also builds fuel-fired steam-jet cleaners. Write for Bulletin SC-500

THE ELECTRODE STEAM BOILER
STEAM-JET CLEANER

STEAM GENERATOR DIVISION
Pantex MANUFACTURING CORPORATION
P. O. Box 660 AX, Pawtucket 1, R. I.

9-307



D. O. Petterson

Wm. Powell Co. — Tulsa

The Wm. Powell Company, manufacturers of industrial valves, recently announced the appointment of Donald O. Petterson of Tulsa as sales engineer for the territory including Oklahoma, Kansas, and part of Missouri. Mr. Petterson was formerly with the Moorlane Co.

Morse Twist Drill & Machine — N. C.

The appointment of Morris E. Yancey, 701 Manhasset Rd., Charlotte, N. C., to sales representative in North and South Carolina for



M. E. Yancey

Morse Twist Drill and Machine Co. was announced recently.

A graduate of the Georgia Institute of Technology, Mr. Yancey has been employed by Milwaukee Electric Tool Corp., Belhaven Wood Products, Hazelhurst, Ga., and the Marietta, Ga. division of Lockheed Aircraft Corp.

Texas Compressor Contract Awarded Cooper-Bessemer

An order for ten of its largest, most efficient engines and centrifugal compressors for mainline gas transmission service has been awarded to The Cooper-Bessemer Corporation by The Transwestern Pipeline Company, Houston, Texas. The units will be installed in the mainline compressor stations of Transwestern.

This order, in excess of 4 million dollars, is for compressor machinery for Transwestern's 30-inch gas pipe line running from the Texas and Oklahoma gas fields to the California border. An important and highly significant feature of this new gas line will be the automatic control of the entire mainline system from one remote point.

Gulf Interstate Company has designed and is supervising the construction of the pipe line system. The initial system is comprised of five mainline stations, each station having two of the Cooper-Bessemer engine-driven centrifugal compressor units.

Burgess-Manning — Ga.

The Industrial Silencer Division of Burgess-Manning Company, 9207 Sovereign Row, Dallas 35, Texas, has announced the appointment of Adams Engineering Sales, P. O. Box 888, Decatur, Georgia, for its broad line of standard and special intake and exhaust silencers for internal combustion engines and other equipment; and pulsation snubbers for closed circuit piping systems, in Georgia and the Southern part of South Carolina.

Allegheny Industrial Electrical Co. — Ala.

John T. Frazier has been appointed manager of the recently-opened Birmingham office of Allegheny Industrial Electrical Company, Inc., Pittsburgh, Pa. Mr. Frazier joined AIE in 1951, and has been project manager for many of the company's major contracts.

DIPCO — Southeast

Leo Miller has been appointed Southern regional industrial sales manager for Dayton Industrial



Leo Miller

Products Company, a division of the Dayton Rubber Company.

Mr. Miller works out of the company's new Atlanta warehouse, handling sales of the Dayton line of industrial V and cog belts, hose, poly-V drives, rubber and rubber-to-metal and molded products.

DON'T LET THE PRICE FOOL YOU!

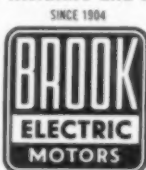
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A.C. MOTORS**

Give Outstanding Service

Anybody who knows motors will recognize that there is no finer motor than the Brook. These motors have established excellent service records in industry. Yet, they actually cost less!

Space age production methods and extensive distribution in 76 countries makes possible this better motor at lower cost. All standard enclosures. 1 to 600 H.P. Start saving now — look into Brook Motors at once. Write for literature and name of your dealer.



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RESULT: efficient service and prompt, dependable delivery to fill your "prescription" from Massey's 21 famous brands. Next time coal is your concern—call on Massey's 15 million ton annual output.

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Southern News Briefs (Continued)

G-E Service Shop, Jacksonville, Fla.

A new facility to repair and rebuild all kinds of electrical equipment for industry will open in Jacksonville, Fla., about March 1, 1960. **General Electric Company** announced recently.

The Jacksonville Apparatus Service Shop will be the newest of 56 G-E Service Shops throughout the country, according to Harold Bongarten, eastern regional manager for the company's Service Shops Department. It will be housed in a new building to be erected this winter.

The new shop will serve industrial firms and utilities in more than 50 counties of northern Florida and southern and eastern Georgia. The shop will provide faster service, especially needed by the paper industry because of its high degree of automation, by reducing time for shipment to Tampa or Atlanta, the nearest established G-E Service Shops.

The shop will be staffed by experts in the repair, modification, and modernization of equipment ranging from large steam turbines and generators, big industrial motors and controls, and ship propulsion systems, down to fractional horsepower motors.

Greenlee Tool Co. — Kans., La.

Greenlee Tool Company, Rockford, Ill., has announced the assignment of the following factory-trained men to sales territories: Gene Seymour, working out of Merriam, Kansas, now travels Nebraska, Kansas, and Missouri. Bill Farley is responsible for Greenlee sales in Arkansas, Louisiana, Mississippi and Alabama, with headquarters at Metairie, Louisiana.

Sperry Contract for Temco

Temco Aircraft Corporation has received a contract valued at more than \$200,000 for machining of components of a classified electronic

countermeasures system from **Sperry Gyroscope Co.**, Great Neck, N. Y. The contract calls for tool fabrication and precision machining of ten different aluminum forgings to be used in the system.

The work is already under way at **Temco's Dallas-Grand Prairie, Texas**, facility, and will continue into the summer of 1960.

New Owner for Frick Co.

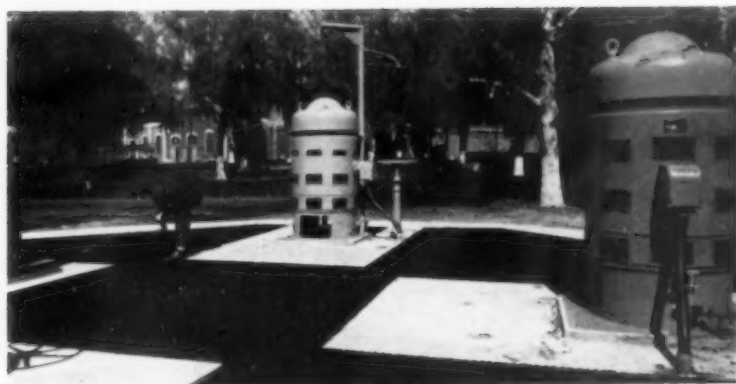
Frick Company, Waynesboro, Pa., is now operating as a subsidiary of the **General Waterworks Corp.**, 1506 Walnut St., Philadelphia, Pa., its new owner. Frick Company keeps the same name and much the same staff. John M. Seabrook is chairman of the board and other officers are W. H. Aubrey, president; A. E. Roschli, vice-president and treasurer; M. W. Garland, vice-president for engineering; and M. B. Watts, secretary. D. Norris Benedict, retiring president, had been with the company 58 years. An expansion of the Frick Company is planned.

Electric Distribution Products — Carolinas

Electric Distribution Products, Inc., Allentown, Pa., has appointed R. W. Chapman Co., 958 Bromley Road, Charlotte, N. C., as sales representative in North Carolina and South Carolina to handle its complete line, including the new Unibus Masteguard electrical distribution system which was introduced to the trade recently.

**KEEP UP-TO-DATE
USE SPI
READER SERVICE**

See Page 67



VISIBILITY AND EASE OF MAINTENANCE are just two of many reasons for using electroforged open flooring in this water pumping station 12 miles north of Charleston, S. C.

Electroforging of the open flooring — which is Blaw-Knox steel grating — increased strength and permanence of the installation. Easy to see through for periodic sub-surface pump checks, the grating is convenient for maintenance personnel. Sections of grating, designed with a roughened twisted bar surface for safe footing, are lifted easily to permit quick access to lower pump areas, and to the inlet tunnel and discharge pipe.

Four electrically operated pumps — each with a capacity of 25 mgd and equipped with manual shutoff — draw water for 30,000 municipal accounts and a pulp processing firm requiring 40 to 50 mgd.

John R. Bettis, manager and engineer for the city's Commission of Public Works, says the Hanahan booster plant increases capacity of a 23½-mile long unlined water tunnel from the Edisto River from 60 to 75 million gallons per day.

R. A. Barr, V.-P., Heads B&W Refractories Division

Robert A. Barr has been elected a vice-president of the **Babcock & Wilcox Company**, and on December 1 assumed charge of the Refractories division.

Mr. Barr replaces James E. Brinckerhoff, who retired after 40 years of service.

Mr. Barr, who will continue to make his headquarters in the Babcock & Wilcox New York offices, was appointed general manager of the Refractories division earlier this year.

appointed exclusive agent for **Cyclotherm Division National U. S. Radiator Corporation** in Washington.

Hampton has already organized a sales and merchandising department within its organization that will be responsible for the sales of Cyclotherm package boiler equipment. Carl Houston has been appointed sales manager. The company also has an excellent service staff which gives 24 hour emergency service available 7 days a week.

Industrial Service Div. Formed by Dow Chemical

Formation of a new division to handle industrial chemical services has been announced by **The Dow Chemical Company**, Midland, Michigan.

(Continued on Page 80)

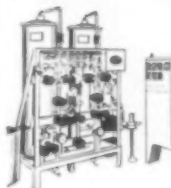
Cyclotherm — Washington

Hampton Maintenance Engineering Company, 2316 Georgia Avenue, N.W., Washington, D. C., has been

MORE "ON ORDER"



CONTROL PANEL OF LARGE AUTOMATIC IONXCHANGER



Automatic IonXchanger shipped fully assembled, ready for hook-up.

We have been designing and building Automatic IonXchangers since 1943. Some of the earliest units are still in successful operation. The current projects listed below range from small equipment for process applications, selling for under \$10,000, to large and elaborate installations priced in the hundreds of thousands.

AUTOMATIC IONXCHANGERS

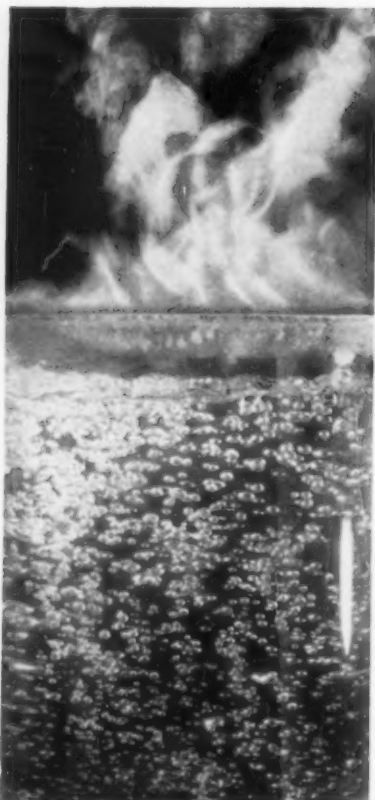
ARE NOW IN PROCESS FOR THESE BUYERS

- ★ MUNICIPAL POWER PLANT IN TEXAS
- ★ CHEMICAL PLANT, UPSTATE NEW YORK
- ★ MIDWESTERN POWER COMPANY
- ★ NUCLEAR POWER PLANT IN EAST
- ★ ANOTHER TEXAS MUNICIPAL POWER PLANT
- ★ NUCLEAR POWER PLANT IN MIDWEST
- ★ EASTERN POWER COMPANY
- ★ MUNICIPAL POWER PLANT, OHIO
- ★ CANADIAN NUCLEAR POWER REACTOR
- ★ CHEMICAL PLANT IN CALIFORNIA
- ★ TWO MORE MIDWEST POWER PLANTS
- ★ SOUTHWESTERN POWER COMPANY
- ★ EASTERN ELECTRONICS PLANT
- ★ METAL PROCESSING PLANT, CALIFORNIA
- ★ ONE MORE TEXAS POWER COMPANY
- ★ EASTERN RUBBER PROCESSOR

In addition to these water treatment installations, orders now in process include large Automatic IonXchangers for special chemical processing applications.

ILLINOIS WATER TREATMENT CO.
840 CEDAR ST., ROCKFORD, ILLINOIS
NEW YORK OFFICE: 141 E. 44th St., New York 17, N.Y.
(CANADIAN DIST.: Pumps & Softeners, Ltd., London, Ont.)

Southern News Briefs (Continued)



WATER FOR BOILERS NEEDS DEOXY-SOL

- to remove O_2
- reduce oxides
- raise pH

Fairmount DEOXY-SOL, a solution of hydrazine, is a high efficiency oxygen scavenger designed especially for high pressure boiler water treatment.

DEOXY-SOL removes oxygen, reduces oxides and raises pH of the condensate all at the same time . . . yet adds no solids.

Stocks in Newark, N. J., Chicago, Ill., Los Angeles, Calif. Investigate its advantages for your system. Write for Bulletin BW.

Fairmount
CHEMICAL CO., INC.
136 Liberty St., New York 6, N. Y.

Known as the Industrial Service Division, it has taken over solvent cleaning functions performed by the company's Dowell division for many years and also provides services and products in the municipal and industrial waste and water treatment areas.

John G. Staudt is president, and John S. Spriggs is vice-president and general manager. Headquarters are in Cleveland, Ohio.

White Motor Co. — Fla.

H. C. Godden, one of The White Motor Company's outstanding transportation experts who has more than 36 years' experience with the



H. C. Godden

Cleveland truck firm, has been named manager of the company's new White Truck Division branch at 5175 West Beaver Street, Jacksonville, Fla.

Mr. Godden's experience with White dates back to 1923, when he joined the company as a technical apprentice following his graduation from Carnegie Institute of Technology. In recent months, he has been a territory manager in Florida and nearby states.

Buckeye Tools — N. Texas

Tool Supply and Engineering Co., 1901 Canton St., Dallas, has been named the authorized representative in northern Texas for Buckeye

Tools Corporation, Dayton, Ohio.

Tool Supply, a Buckeye industrial distributor for many years, now has the status of a full manufacturer's representative in an area stretching from the Arkansas border to the El Paso County line and including the cities of Abilene, Dallas, Fort Worth, Lubbock, Odessa, San Angelo, Texarkana, Waco, and Wichita Falls.

KEEP UP-TO-DATE USE SPI READER SERVICE

See Pages 67 & 68

Emerson Electric — S.W.

A new Southwestern merchandise sales region has been established by Emerson Electric Mfg. Co., St. Louis, Mo.

Jack Rogers, who has a 20-year sales experience background with the company, is regional sales manager for the new area. Bill Richard, who has five years' company experience in the lighting field, is lighting specialist.

The new sales region includes all of New Mexico, Texas, Oklahoma, Arkansas, the northern part of Mississippi, western Tennessee and western Louisiana.

Parker Hannifin — Tex., Tenn.

Parker-Hannifin Corporation, Des Plaines, Ill., has announced the appointment of two new distributors for its Crown line — encompassing regulators, filters and lubricators.

Leinart Engineering Co., 412 Fifth Ave., N.E., Knoxville 5, Tenn., has franchisement as distributor of the Crown compressed air line units; and Truckers Equipment Inc., 1517 North Port Ave., Corpus Christi, Texas, is also a new distributor for the Crown line.

Carboline — Tex., La.

William A. Wood, Jr., has joined the technical sales department of the **Carboline Company**, P. O. Box 14284, Houston 21, Texas, where he



Wm. A. Wood, Jr.

is associated with O. A. Melvin to cover technical sales in the Texas-Louisiana area.

A graduate of Tulane University with a bachelor's degree in chemical engineering, Mr. Wood has been active in the field of protective coatings design, sales and service in the Gulf Coast area for over 10 years.

R. B. Ames Mgr. Marketing at G-E Plant — Rome, Ga.

Robert B. Ames has been named Manager - Marketing at **General Electric's** Medium Transformer Department in Rome, Ga.

Mr. Ames joined the General Electric Company in July, 1950. He has held assignments in market research and product planning, as well as various sales areas. In 1956, he was named Manager-Sales for the Medium Transformer Department, a position he held until his present appointment.

Southwest Heating & Air Conditioning

An inclusive display of heating, ventilating, air-conditioning and refrigerating products is assured for the **2nd Southwest Heating & Air Conditioning Exposition**, covering commercial, industrial and residential fields and revealing many developments in components and in

equipment for field installation and servicing.

All available exhibit space has been taken at the Dallas Memorial Auditorium, where the Exposition will be held February 1 to 4, under the auspices of the American Society of Heating, Refrigeration and Air-Conditioning Engineers, in conjunction with the Society's meeting in the Texas city.

A wide variety of new products will be brought out at the Exposition, new exhibitors will make their bow to the national market and a number of established concerns will branch out into new fields.

The management will be staffed by International Exposition Company, with permanent headquarters at 480 Lexington Avenue, New York 17, N. Y. E. K. Stevens, president of the company, is manager of the Exposition.

Yale & Towne — Okla.

Marshall Supply & Equipment Co., Inc., with headquarters at 920 E. Archer in Tulsa and a branch facility in Oklahoma City, has been named exclusive Yale industrial lift truck and tractor shovel franchise representative for the State of Oklahoma, according to an announcement by **The Yale & Towne Manufacturing Co.**



James V. Swift

One of Oklahoma's leading industrial supply firms since 1919, the new representative has been an outstanding Yale hoisting equipment distributor for more than 30 years.

James V. Swift will be in charge of lift truck and tractor shovel sales. He was previously affiliated with Yale as Manager of the Dallas Branch of the John C. Mayfield Co., Houston representative.

Babbitt Adjustable SPROCKET RIM with Chain Guide Changes that Danger Zone to a SAFETY ZONE



The distance between the floor of your plant and your overhead valves is a **DANGER ZONE** when piled up boxes or even ladders are used to reach the valves.



Turn it into a **SAFETY ZONE** — equip your overhead valves with Babbitt Adjustable Sprocket Rims with Chain Guides.

- They simplify pipe layout.
- They fit any size valve wheel.
- They are easy to install and operate.
- They operate any valve from the floor.
- They save time and money.
- The first cost is the only cost (no maintenance).
- They are packed completely assembled (one to a carton), with easy-to-follow instructions.
- A hot-galvanized rust proof chain is available for all sizes.

Babbitt Adjustable Sprocket Rims with Chain Guide are carried in stock by most mill supply houses. If your supplier does not carry them, contact us direct.

Babbitt

STEAM SPECIALTY CO.

3 BABBITT SQUARE, NEW BEDFORD, MASS., U.S.A.

FOR WATER Softening AND Conditioning.



**STRONGLY ACIDIC
-STRONGLY BASIC
TWO-BED DEMINERALIZER**

Pictured above is a large heavy duty demineralizer with solo valve manual control, located at a Florida Air Force Base. One of many demineralizers and water conditioners designed and manufactured by Southern Water Conditioning, Inc. Write for further data, specifications, bids or surveys.

All types of Domestic, Commercial, and Industrial Water Softening and Conditioning Equipment. Filters - Taste and Odor Removers - Aerators - Demineralizers - Zeolite, Ion Exchange Minerals in stock - Residential and Commercial Package Swimming Pool Filters - Also Rebuilding and Modernizing.



Southern Water Conditioning, Inc.
301 15th Avenue South
St. Petersburg, Florida

News Briefs (Cont.)

ASM — Southwest

Preparations are being made by all 10 chapters of **American Society for Metals** within 600 miles of Dallas for participation in the 2nd Southwestern Metal Congress and Exposition May 9-13.

Allan Ray Putnam, managing director of the national society, says members of ASM and many other technical and engineering groups in the entire Southern and Southwest areas will receive invitations to attend.

Congress sessions will be held in the Sheraton Dallas Hotel by ASM. Other societies, including American Welding Society and Society for Non-Destructive Testing will meet in various Dallas hotels. The exposition, a recurrent ASM event, will be presented in State Fair Park. Chairman of exhibits is Robert K. Sorensen, Haynes Stellite Co., Houston.

Electric Distribution Products — S.E., S.W.

New sales representatives appointed by **Electric Distribution Products, Inc.**, Allentown, Pa., include the following: Gregory-Salisbury & Co., with offices in Louisiana, Mississippi, Tennessee, Alabama, and Arkansas; Robert S. Fishburne, Richmond, Va.; Powell Electrical Mfg. Co., Houston, Texas; R. W. Chapman, Charlotte, N. C.; South East Engineering Services, Inc., South Jacksonville, Fla.; R. L. Browne Co., Shawnee, Kans.; and Chuck Koerner, St. Louis, Missouri.

Louisiana Firm Named For Parker Fittings

Louisiana Supply Company Inc., Drawer 1481, Lake Charles, Louisiana and 1412 Airline Highway, Baton Rouge, with branches also at Crowley and Morgan, Louisiana, is a newly franchised distributor for **Parker-Hannifin Corporation's** industrial tube and hose fittings.

Keep Up With Recent Developments at the **2nd Southwest HEATING & AIR-CONDITIONING EXPOSITION**

(under the auspices of ASHRAE)

Dallas, Texas • Feb. 1-4, 1960

Memorial Auditorium

WHEREVER your interest lies . . . industrial . . . commercial . . . institutional . . . domestic . . . you'll find this informative exposition packed with new products, new facts, and new ideas that can be put to work for you.

SEE more than 200 fact-filled displays covering recent progress in air handling and treating equipment, as well as refrigeration.

MEET more than 1000 technical representatives of the leading manufacturers in your industry.

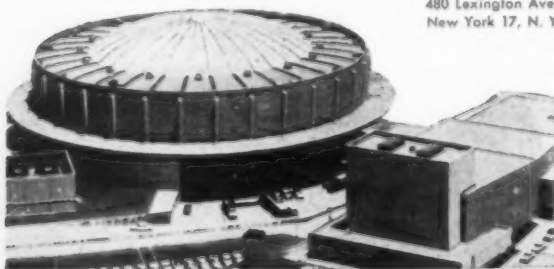
DISCUSS with them how their new products can lead to bigger profits for you.

COMPARE and judge at first-hand the relative merits of competitive products.

DECIDE which of them can best suit your needs.



Management: International Exposition Company, Inc.
480 Lexington Ave.,
New York 17, N. Y.



Loosens

**FROZEN PARTS
FAST!**

Handy
Won't
Leak
Shoots
3 Feet

KANO AeroKroil

It loosens the toughest corroded, frozen or stuck parts.

DIRECTIONS: Spray directly on the part to be loosened. Let it penetrate for a few minutes. Then try to move the part. If it is still stuck, repeat the process. No need to wash off.

NO LABORATORIES

Same formula as famous Kroil that has pleased 14,000 industrial users for 10 years or more. Loosens stuck together metal parts, bushings, bearings, bolts, screws, pipe, etc., "anything from an embalmer's needle to a bulldozer," one customer said. "Like an extra employee," said another. "Turned rust into mush, put \$50,000 equipment back to work."

You too can get these results. Try AeroKroil at our risk. Send \$2 cash, and we'll pay postage.

KANO LABS. 1047 Thompson Lane, Nashville 11, Tenn.

12-OZ. CAN \$2.
F.O.B. NASHVILLE
CASE OF 12 \$18.75



LOOK FOR QUALITY

in your
hot water generator...
look to **FINNIGAN**

Finnigan Hot Water Generators are engineered to give you large quantities of hot water for low operating cost. The finest materials, creative skill and quality construction assure efficient performance... "Fabricated by Finnigan" assures quality. Finnigan builds hot water generators to your specifications. Call, wire or write today for complete information with no obligation to you.



**TANKS, SMOKESTACKS, PIPING,
WATER HEATERS, BREECHING, PLATE WORK**

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722 Marietta St., N. W., Atlanta, Georgia

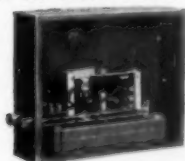
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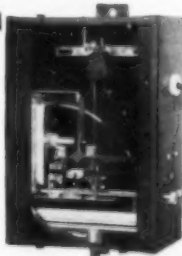
Now! Ellison Pointer Draft Gages and Air Filter Gages with Integral Alarm or Signal System!

To indicate and control pressure of Gas or Air, these indicating Draft Gages have magnetic type mercury switch for operating alarm and/or signal light. Available with one or two switches for either high or low electrical contacts for alarm purposes. Transformer, alarm bell, siren, horn signal light, 110 or 220 volts, optional.

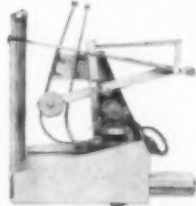
Send for Bulletin 216.



Independent Alarm system to convert existing gages or air or gas pressure operations needing a "too high" or "too low" warning.



Dial Pointer Gage with Integral Alarm System. Dial scale removed.



Straight Line Pointer Gage with Integral Alarm System. Unit shown with vertical scale, without gage housing.

ELLISON DRAFT GAGE CO.

554 W. Monroe St., Chicago 6, Illinois

THE ELLISON LINE ALSO INCLUDES:

Draft Gages, Bell and Dial — Inclined Draft Gages — Portable Inclined Vertical Tube Gages — Vertical Tube Gages, Oil, Heavy Liquid and Mercury, Single and Multi-Tube — U-Gages, Stationary and Portable — Air Filter Gages, Dial and Inclined Tube Types — Pilot Tubes — U-Path Steam Calorimeters — Portable Gas Analyzers, Orsat Type — Alarm Systems

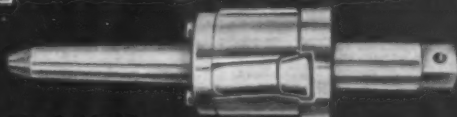
Keep boilers on the line with

WILSON TUBE MAINTENANCE TOOLS

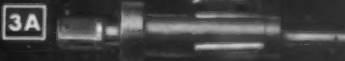
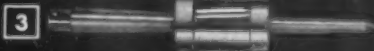
1 Air driven tube cleaners



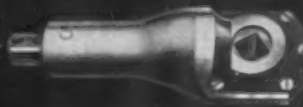
2 Self-feeding tube expanders



Model E Expanders



4 Right angle bevel gear drive



1 Heavy-duty air driven tube cleaners are designed to deliver maximum power at the most efficient cutter head speeds while negotiating sharp bends, the Model ECT Air Cleaners are excellent for cleaning curved boiler tubes from 2½" to 4½" O.D.

2 Wilson Model 38 tube expanders are self-feeding and parallel expanding. They are of the single flare roll type. Available for tubes 1" O.D. to 4½" O.D. with various roll lengths for tube seats ¼" and up.

3 Flaring type expander 1" O.D. to 4½" O.D. tubes, ½" to 2" tube seats.

3A Long reach type expander 1" O.D. to 4½" O.D. tubes, 2½" to 5" tube seats.

4 This Wilson bevel gear drive is expressly manufactured to meet continuous and heavy duty service conditions. The one piece all steel body is extremely rigid and not subject to distortion. The maintenance of perfect gear alignment is assured with consequent long service life.

Write today for your copies of Wilson Tube Cleaner catalog No. 77 and Wilson Tube Expander catalog No. 88.

TW-882

Representatives in principal cities
THOMAS C. WILSON, INC.
21-11 44th Ave., Long Island City 1, N. Y.
Cable address: "Tubeclean", New York

WILSON
TUBE CLEANERS • TUBE EXPANDERS



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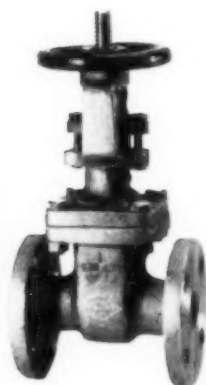
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Ziegler & Co., G. S. *



For 99 out of 100 . . . Selection of Stainless Steel Valves can be as simple as selection of Bronze and Iron valves

HOW to keep it simple? Don't let the wide selection of stainless steel alloys "throw you"!



Most of the alloy specs were developed to meet certain highly specialized and rather uncommon needs. Only 1 out of 100 valve users can make practical use of many of the alloys. Actually, just two or three of the different available alloys will give a big majority of valve users all they want and need.

You can judge DESIGN differences between the various "makes" exactly as you do it with Bronze and Iron valves. Look them over and compare. Basically, of course, a Stainless Steel valve is designed and constructed very much like other valves.



What is left to worry about in addition to Material and Design? The

same factors you consider in buying ANY valves for long, dependable performance: Are the valves made merely good enough, or to a standard that demands an extra-measure of quality? How good are the castings? How precise and perfect is the machining? How rigid is the inspection and testing during manufacture? These are the factors which specs can't cover. Some of them you can't see when you look at the valve. But you KNOW how to make sure they measure-up to peak standards. You know that the name



JENKINS VALVES and the famous Jenkins DIAMOND trademark have been the highest assurance of quality for nearly a century.



Specify "Jenkins" as well as the metal alloy to assure fullest satisfaction. Your Jenkins Distributor has patterns and alloys to satisfy most industrial needs. Of course, they meet valve industry specifications and the high standards established by leading users of stainless steel valves. Jenkins Bros., 100 Park Ave., New York



JENKINS VALVES



Jenkins Bros.
100 Park Ave., New York 17.

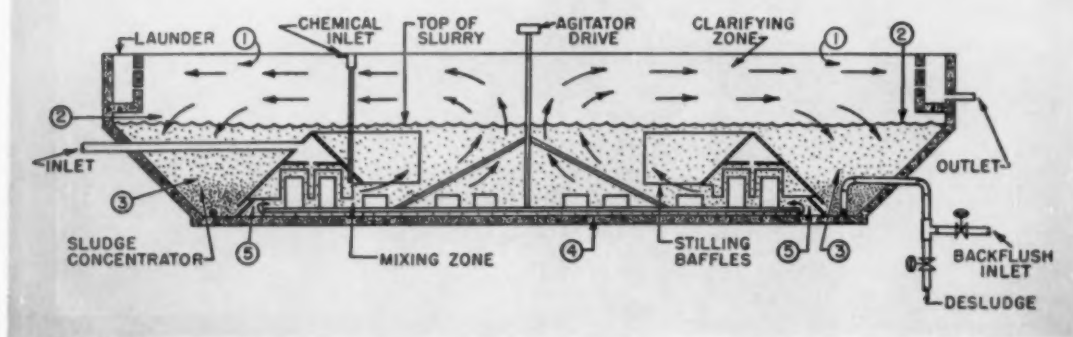
Send Jenkins Stainless Steel Valve Catalog to —

Name & Title _____

Company _____

Address _____

COCHRANE... FIRST IN WATER CONDITIONING



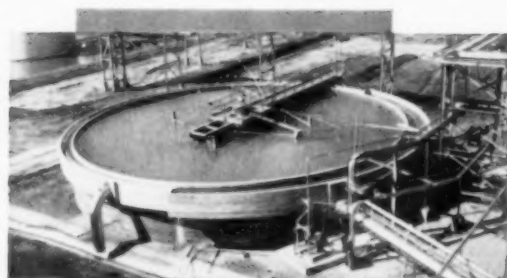
A Cochrane solids contact reactor is designed to provide the ultimate in clarification

Cochrane suspended solids contact coagulating and softening clarifiers are packaged units that combine a mixing zone at the bottom with a clarifying zone above.

A bottom agitator in the mixing zone keeps old precipitates in constant suspension. Thorough mixing and contact between the old and new precipitates is thus assured. This results in a more complete reaction with a minimum in chemical requirements and retention time. In the clarifying zone the water is effectively separated from the slurry precipitates and clarified.

The Cochrane reactor design is unique in its baffle and agitator arrangement, as follows:

- ① Radial Horizontal Flow—Not Upflow. Velocity decreases from center to launder. Slurry particles separate more efficiently from horizontal flow than from upflow.
- ② Slurry flow is downflow in clarifying zone below collecting launders—not upflow—thus preventing carryover of turbidity into effluent.
- ③ Sludge settles only in annular concentrator outside of mixing zone. Maximum concentration results because no turbulence is present. This feature saves wastage of water in desludging.
- ④ There is no premature loss of slurry strength in mixing zone because no sludge settles on the floor of mixing zone.
- ⑤ Turbulence in mixing zone assures excellent mixing. A large, full-diameter agitator causes centrifugal outward flow, against the diverting baffle in front of the outer port and turns flow inwardly towards central port.



72' diameter, capacity 9,000,000 GPD located in Georgia.



72' diameter, capacity 9,000,000 GPD located in Texas.



Two units 82' diameter—capacity 20,000,000 GPD located in Washington.

Cochrane

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